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Vol. 4 No. 7 November 1988 £1.25



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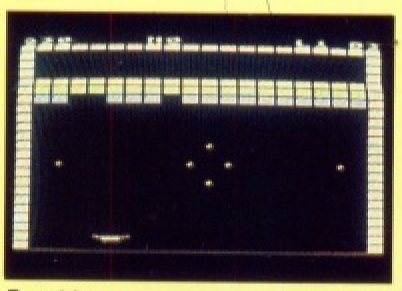
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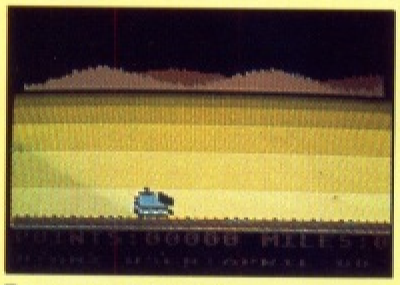
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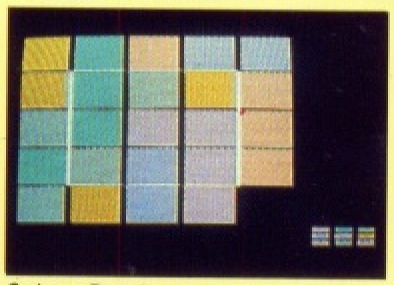
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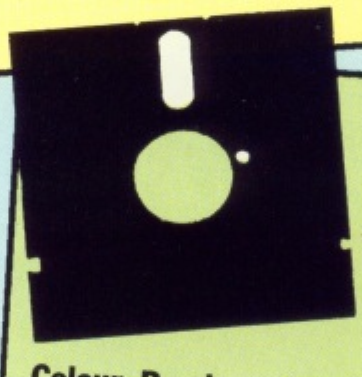
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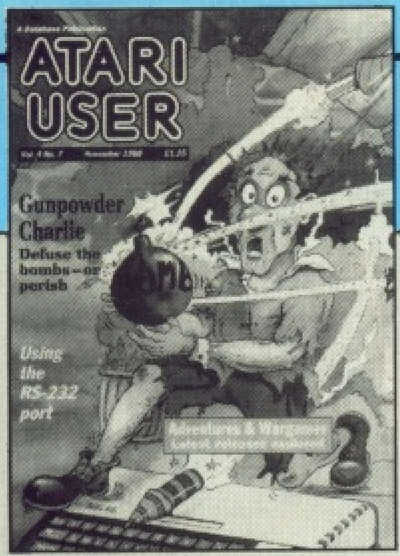
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Ken Hughes

PRODUCTION EDITOR:
Peter Glover

EDITORIAL ASSISTANT:
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REVIEWS COORDINATOR:
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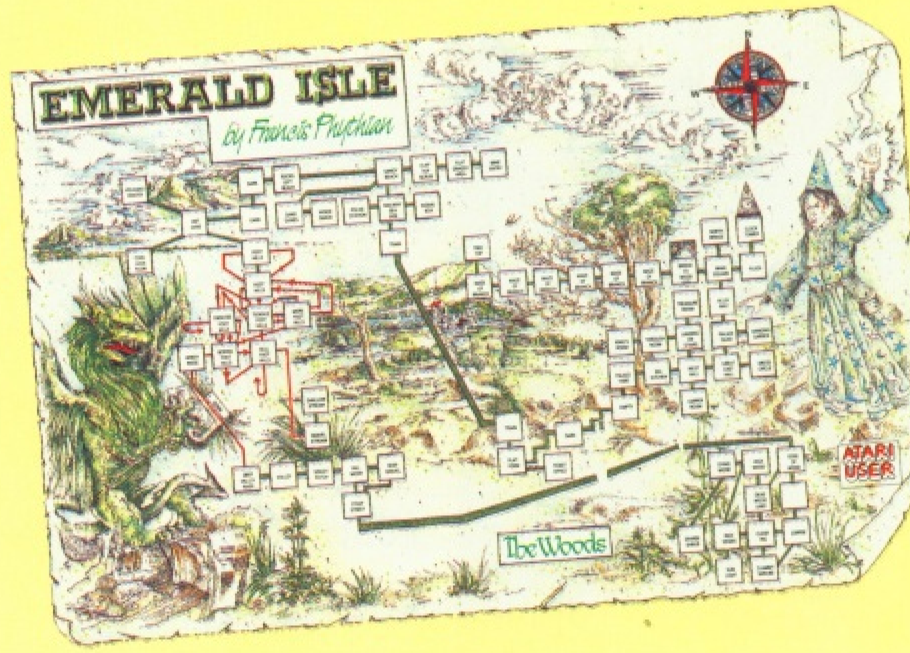
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ATARI USER + PAGE 6 ATARI USERS MAGAZINE

This is the last issue of *Atari User* in its present form. Our January issue will appear in the new year as Page 6 ATARI USER, a new bi-monthly publication providing outstanding coverage of your Atari from the resources of the two longest established Atari magazines. Any correspondence for *ATARI USER*, including advertising and articles for publication, should be addressed to: Page 6 Atari User, PO Box 54, Stafford, ST16 1DR.

The great Christmas fun show

THE theme for this year's Atari Christmas Show is entertainment – and that means games galore for 8 bit owners.

The show, set for London's Alexandra Palace on November 25-27, will play host to more than 70 exhibitors, all offering brand new products or bargains in hardware, software and add-ons.

Heading the all-star line up will be Atari itself, with a range of products demonstrating that it's still solidly behind the 8 bit range despite massive ST sales.

That dual commitment is evident from the leading software houses too – Tynesoft will be on hand with its complete range of software, including some titles on show for the first time.

One of the biggest attractions for gamers will be the Big Game High Score Contest, which will be open to all visitors.

Featuring Double Dragon, the ST version of the arcade game of the year from Melbourne House, the free competition will offer a major prize from Virgin-Mastertronic for the eventual winner.

There'll be any number of utilities on display for both the 8 bit machines, and visitors looking for that extra add-on, or just a fresh batch of discs to fill up, will be spoilt for choice, with bargain prices for peripherals being the order of the day.

And for anyone who gets tired of Christmas shopping, there'll be a games arcade – the ultimate try before you buy experience.

Big promotion for 8 bit machines

THE Atari UK drive for dominance in the home computer entertainment marketplace shifts up another gear this winter.

A nationwide, £2 million TV campaign will include a new commercial for the XE in order to promote the machine and its latest leisure software offerings.

Atari UK boss Bob Gleadow told *Atari User*: "We consider this to be money well spent – there's a lot of life left in the XE yet.

"We're promoting the 8 bit machines as much as we can. In particular we have the Atari Games Centres scheme which is becoming most successful with its attractive presentation of machines and software.

"At the moment we have 67 Atari Games Centres established all over the UK and we expect this number will reach 110 by the end of the year".



Pat's busy at Xmas

ONE of this year's most impressive performers in the budget entertainment market, Alternative (0926 814132), will be launching a game based on book and TV character Postman Pat.

"Postman Pat is being programmed by a top team and we expect a Christmas number one for this game", said a spokesman.

Atari interest in the PC Show

EVEN in the rarified MSdos-dominated atmosphere of the PC Show there were products to interest Atari 8 bit users who were prepared to trawl the recesses of Earls Court.

Mandarin Software (0625 878888) made its debut in the XL/XE marketplace with Lancelot, a triple adventure based on the Arthurian legend which offers a chance to win a £5,000 replica of the Holy Grail. Price £14.95.

Grandslam (01-247 6434) launched its Atari XL version of the Alternative Reality-The Dungeon, price £14.95.

There was the first public showing by Level 9 (0344 487597) of Ingrid's Back, the satirical animated sequel to Gnome Ranger, price £14.95.

A new joystick for the Atari from Konix (0495 350101) made its debut. The £14.99 ergonomic Navigator was described by Konix director Sandra Holloway as "the best joystick we've produced – it's also the best looking joystick ever".

Cheetah (0222 555525) provided competition with the Starfighter, described as "the ultimate in joystick technology", price £14.95, and the "straightforward no nonsense" Challenger, price £4.95. The Mach I has been reduced in price to £10.95.

Little Office (051-666 1190) was showing its new Copi Clip document holder which attaches to a monitor in the same way as the firm's best-selling Thingi but has a rotating arm. Price £6.99.



Cheetah's Starfighter

LINK WITH THE SHADES

Latest additions to the facilities available on MicroLink include multiple fax and the opportunity to play the popular cult game Shades.

Subscribers can now send fax messages to up to 50 addresses simultaneously.

And up to 128 users at one time can play Europe's most popular online adventure game Shades – which involves a massive and mysterious universe populated by magical characters in search of treasure and status.

Better Basic Boolean

LEN GOLDING continues his Basic series by looking at quasi-mathematical short cuts

FASTEN your seat belts, because this month we're going to take off into the world of Boolean algebra. No, don't panic – it's nothing like schoolwork and bears only a slight passing resemblance to conventional maths. It's a lot easier to master for one thing, and allows you to perform all sorts of computing tasks which would be very cumbersome in conventional Basic. So it's worth a bit of effort to understand the principles.

The first thing to get clear is that Boolean Algebra is not a mathematical system – or at least, not the kind you're used to. Boolean expressions look rather odd at first glance, since they resemble statements of fact, rather than algebraic equations or conventional Basic instructions.

Here are a few examples:

```
(N=42) (A>B) (N=5 OR X<Y)
(HITS>1 AND LIVES>0)
(A$="ELEPHANT")
```

A Boolean expression must be contained in brackets, and has to be phrased in such a way that it can be either *true* or *false*. If it's true, then the whole expression will behave just like the number 1. If it's false, the expression will behave like 0. For example, look at this statement:

```
X=(Y>50)
```

If the expression in brackets is true – that is, if Y is genuinely greater than 50 – then X will take the value 1. If, on the other hand, Y is less than or equal to 50, then X will become equal to 0. The equivalent in conventional Basic requires two statements:

```
IF Y>50 THEN X=0
IF Y<=50 THEN X=1
```

or, more compactly:

```
X=0:IF Y>50 THEN X=1
```

Even in a simple example like this, the Boolean version is considerably shorter, and fits into a single statement, so there's no need for a new line or a colon. Here's one that's a little more complex:

```
N=(S=5 AND X<Y)
```

In this case N will become equal to 1 if both the conditions in the brackets are true – that is, if S is equal to 5 and X is less than Y. In all other circumstances, N will take the value 0. Conventional Basic would put it in one of two ways:

```
N=0:IF S=5 THEN IF X<Y THEN N=1
```

or

```
N=0:IF S=5 AND X<Y THEN N=1
```

You can also use OR in just the same way:

```
N=(X>1 OR Y<10)
```

This is the same as saying:

```
N=0:IF X>1 OR Y<10 THEN N=1.
```

So far there's no major advantage over the familiar IF...THEN statements, but lets take a look at what happens if we go one stage further:

```
X=X+(S=7)-(S=11)
```

Only one of the expressions in brackets can be true, since S cannot have two different values at the same time. If S=7 the statement evaluates to: X=X+1–0. If S=11 the statement becomes: X=X+0–1. Any other value for S will give: X=X+0–0. In other words, X is incremented if S=7, decremented if S=11 or left unchanged if S is any other number. Just the sort of thing we need for a joystick routine.

Conventional Basic, using IF...THEN statements, would require at least two program lines to achieve the above result. And Boolean statements can

carry on introducing more and more expressions, without constantly needing new lines, and without packing up at the first un-met condition.

Two or more sub-expressions can be linked together into a single larger expression, like this:

```
N=((A>0 OR B>0) AND (C=10))
```

Each sub-expression is first evaluated independently in terms of true or false, then the whole statement is examined to determine its overall truth value. In this case, if both sub-expressions are true, then N will take the value 1, but if either is false, N becomes 0.

We saw an example of this *nesting* technique in last month's arcade game, which used a Boolean routine to move the gun right or left under joystick control. This was the line that did most of the work:

```
X1=X+((S=7 OR S=6 OR S=5) A
ND (X<19))-((S=11 OR S=10 O
R S=9) AND (X>0))
```

It looks complicated but, if you work it out, you'll see it boils down to a simple X1=X+Y–Z format, where Y represents the true/false value of the entire Boolean expression in front of the minus sign, and Z the value of everything after it.

In this example, X1 is the new position, X is the old position and S is the number returned by the joystick. The left and right screen boundaries are set at 0 and 19 respectively, to suit Graphics mode 1.

Because the joystick cannot be in two positions at once, only one of the two main expressions can be true at any given time – though they may both be false, of course.

This means that the entire statement can produce only three possible outcomes:

X1=X+1–0 equivalent to: X1=X+1

or:

X1=X–1+0 equivalent to: X1=X–1

or:

X1=X+0–0 equivalent to: X1=X

just like our simpler example earlier.

Here's an approximate translation of the whole Boolean statement into English:

"If the joystick is pointing right, or up-right or down-right, and if there is room to move right, then add 1 to the current value of X. Conversely, if the stick is pointing left, or up-left, or down-left then, provided there is room to move left, subtract 1 from the current value of X. If the stick is pointing elsewhere, or if there is no room to move in the specified direction, then leave X unchanged. Whatever the outcome, set X1 equal to the recalculated value of X."

It's a lot to squeeze into one line and Basic has to work hard to evaluate it – so it's a little slower than a properly-designed set of IF...THEN statements. But in many cases the reduction in program length and complexity is worth a small sacrifice in speed.

Here's another example of Boolean versatility:

```
N=N+(N=0)-(N<>0)
```

If N is 0 at the time of checking, it changes to 1, and vice-versa. I've used this technique in the Gadgets series to flash lights on and off, but it could work equally well in a game loop. For example, to toggle a character between two colours, or two shapes, as it moves.

If you want a Boolean statement to generate numbers other than 1 or 0, simple arithmetic will do the trick. For example:

```
N=5*(X=100)+10*(X<>100)
```

The value of N will be 5 if X=100, or 10 if X is any other number. Here's a novel application of this technique:

```
10 SOUND 0,60,10,8*(STICK(0
)<>15):GOTO 10
```

This plays middle C whenever the joystick is moved in any direction and falls silent when it is centralised. Can you see why? The last number in a SOUND statement controls volume: 8 is normal listening level and 0 is off.

If the joystick is centralised, it returns the number 15, so the Boolean expression evaluates to 0. The volume parameter therefore becomes 8*0 and the sound turns off. Any other stick position will return a number other than 15, so the volume parameter becomes 8*1, and you hear the tone.

Remember the musical joystick we described in February? It took 12 lines of Basic, with nine IF...THEN statements. Boolean algebra can do the

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◄ From Page 7

```
10 S=STICK(0):P=121*(S=14)+
108*(S=6)+96*(S=7)+91*(S=5)
+81*(S=13)+72*(S=9)+64*(S=1
1)+60*(S=10)
20 V=8*(S<>15):SOUND 0,P,10
,V:GOTO 10
```

Eight different pitch values are linked via Boolean expressions to the eight *active* stick positions. Only one of these can be true at any given time, so only one pitch value gets selected – the rest all become 0 and are ignored. Volume is controlled as in our previous example, turning on if the stick is moved, or off if it's centralised.

Boolean techniques can often come to the rescue when Basic is floundering. For example:

```
10 GOTO 100*(X=0)+200*(X<>0)
```

This becomes GOTO 100 if X=0, or GOTO 200 if it's any other number, simulating the ELSE command, which is missing from Atari Basic. Or how about this:

```
10 GOTO 10*(STRIG(0)=1)+100*
(STRIG(0)=0)
```

This locks the program until the joystick trigger is pressed, then jumps to line 100.

Another interesting effect can be seen here:

```
10 N=((A>0)+(B>0)=1)
```

If you work it all out, you'll see that N becomes 0 if the sub-expressions are both true or both false, but 1 if the two truth values are unequal. This simulates the *Exclusive OR* function, which Atari Basic doesn't possess.

● *If you've stayed with us so far, you're now out of the Beginner league and ready to tackle Intermediate level programming. We'll make a start next month by looking at the multi-colour map modes – Graphics 3 to 7 – which, among other things, let you draw freehand shapes on screen. See you then.*

SoftwarE SCENE

STEPHEN FAWCETT reviews the new games software released for your 8 bit Atari

Hero to the rescue

Product: Joe Blade
Price: £1.99 (tape)
Supplier: Players Software, Calleva Park, Aldermaston, Berkshire RG7 4QW.
Tel: 07356-77421

IN an ambitious raid, a group of dangerous terrorists led by the infamous Crax Bloodfinger has kidnapped six of the world's leaders. A 30 billion dollars ransom is being asked for their safe release – and if it isn't paid they will all be killed.

The governments of the world have refused to pay and, as the deadline draws closer they have decided to take the only course of action left open to them – send in Joe Blade.

You play the part of Joe and armed only with a light, semi-automatic machine gun you must infiltrate Bloodfinger's massive fortified HQ in a central American country.

The base is heavily guarded by Bloodfinger's private army and underground henchmen. As you traverse the corridors, any contact with them will drain your strength until you eventually die.

Also located within the stronghold, in random locations, are six booby-trapped explosives, all of which must be armed. When this has been done you will have 20 minutes before they detonate to find all the hostages and reach the exit.

To arm the explosives you must rearrange the access codes into alphabetical order using left, right and fire on your joystick to swap the letters. If you don't do this correctly they will detonate and kill you.

You will also find uniforms, ammunition and food scattered around the garrison.

When you eat the food you will find your strength rating will go back up to full. A uniform allows you to walk among the enemy troops without being drained of strength and the ammunition will replenish your limited arsenal.

The main action takes place within a scrolling window in the centre of the screen. At the bottom, reading from left to right, are indicators for men remaining, keys collected, bombs armed and the amount of ammunition you have left.

In addition is the time remaining indicator – which registers when all bombs are armed – and your overall score. At the top of the screen a bar indicates how much strength you have left – when it reaches zero you are dead.

The graphics are brilliant and the sound effects – what there are of them – are excellent.

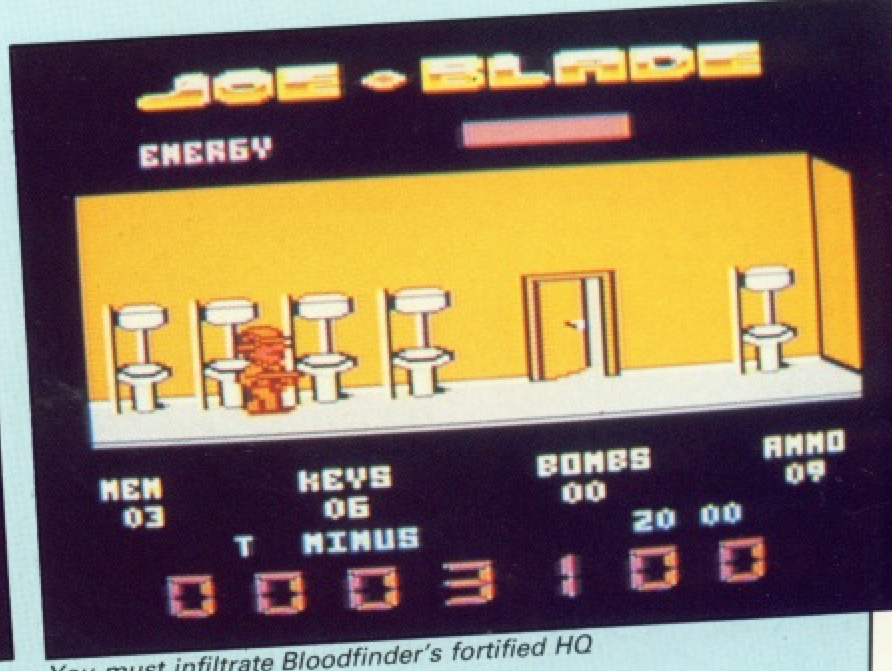
I particularly liked the ricochet of bullets you hear when you return to the main menu screen.

I first saw Joe Blade on the ST and thoroughly enjoyed playing it. Now it has been released for the 8 bit Atari and is just as playable – and an absolute bargain at £1.99. Go out and buy it straight away, you won't regret it.

Sound	*7*
Graphics	*8*
Playability	*9*
Value for money	*10*
Overall	*8·5*



The state of your health is always shown on-screen



You must infiltrate Bloodfinder's fortified HQ

Learn with Mickey



Product: Mickey in the Great Outdoors (Walt Disney)
Price: £9.95 (disc)
Supplier: Atari World, 11 Fennel Street, Manchester M4 3DU.
Tel: 061-834 4941

IT has been a long time since a piece of educational software has been reviewed in *Atari User*, but Mickey in the Great Outdoors was well worth the wait.

Designed for children aged 7 to 10, the idea is to move Disney's Mickey Mouse along on his adventure as quickly as possible, learning as he goes.

It's always a challenge because the further Mickey advances the harder are the obstacles he must try to overcome.

The game is split into two major activities: Mickey Goes Hiking and Mickey Goes Exploring and each is split into a further two, thus making four educational topics for the player to master.

The first of the two major activities is designed to develop and reinforce essential grammar and spelling skills. This is accomplished by helping Mickey finish incomplete sentences and by creating words out of scrambled letters.

The second is designed to develop and improve two basic mathematical skills – equation solving and number sequencing. You must guide Mickey through this second adventure by finishing incomplete equations and completing numerical sequences in their proper order.

To load the game you must remove all cartridges from older machines and hold down the Option key on newer models while switching on. The program will load and you will be presented with the title screen.

Next comes the main menu from where you choose between the two major activities – pressing the Select key toggles between them. At any stage during an activity you can opt out and skip to the next section. Pressing Option moves you to a sub-menu where you can make your choice.

All Micky's actions are controlled by a joystick plugged into port one, and the fire button will make his selection. Each action is always accompanied by an animated sequence so you know exactly what has happened throughout the games.

In Micky Goes Hiking you select a word from a group of four in order to complete a five word sentence. The missing word can be a noun, verb, adjective or adverb. By emphasising complete gramatical sentences, this helps develop effective writing and speaking skills.

The second activity involves rearranging a random pattern of four letters until they form a word. While doing this you become familiar with the correct placement of consonants and vowels, which will help build a firm foundation for good spelling skills.

In the first activity of Micky Goes Exploring you have to select the correct numeral or arithmetic symbol to complete an equation. This activity exercises the ability to solve problems involving addition, subtraction, multiplication and division.

The second exercise – and to my mind the most difficult – challenges you to complete a logical pattern of numbers. By recognising the correct series of digits and then identifying those numbers which complete

Also ran...

Product: California Run
Price: £1.99 (tape)
Supplier: Alternative Software Ltd, Units 3-6 Bailygate Industrial Estate, Pontefract, West Yorkshire WF8 2LN
Tel: 0977 797777

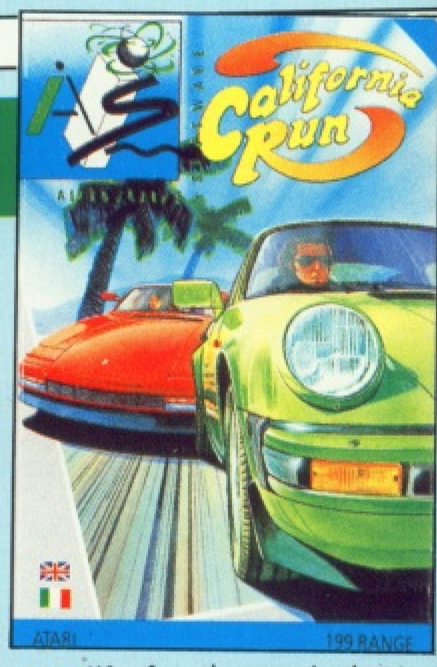
YOU play the part of the local hotshot and street racer from the town of Charlotsville and have been chosen as the local representative in the California Run. It's the biggest race in America – and the most dangerous.

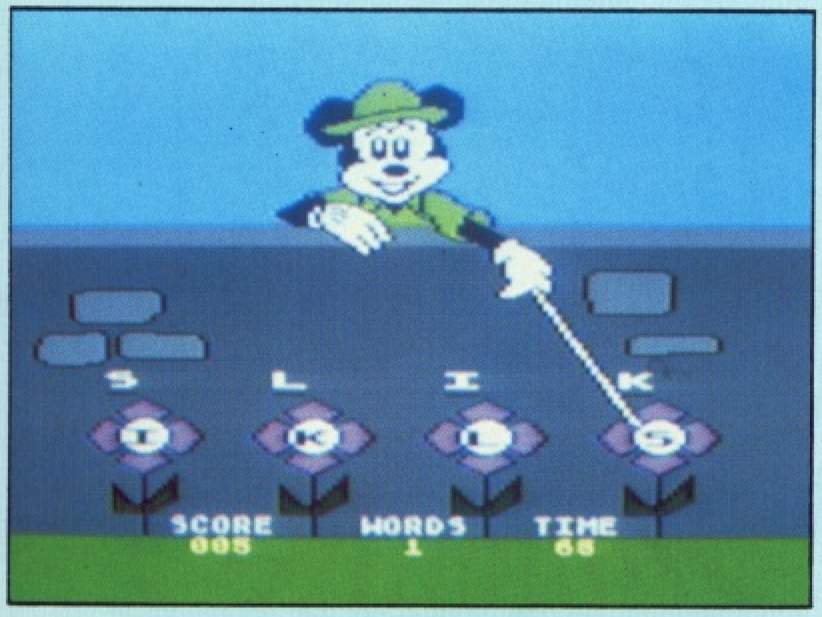
Your little town has clubbed together and raised enough money to give you the choice of a Porsche, Ferrari or Corvette.

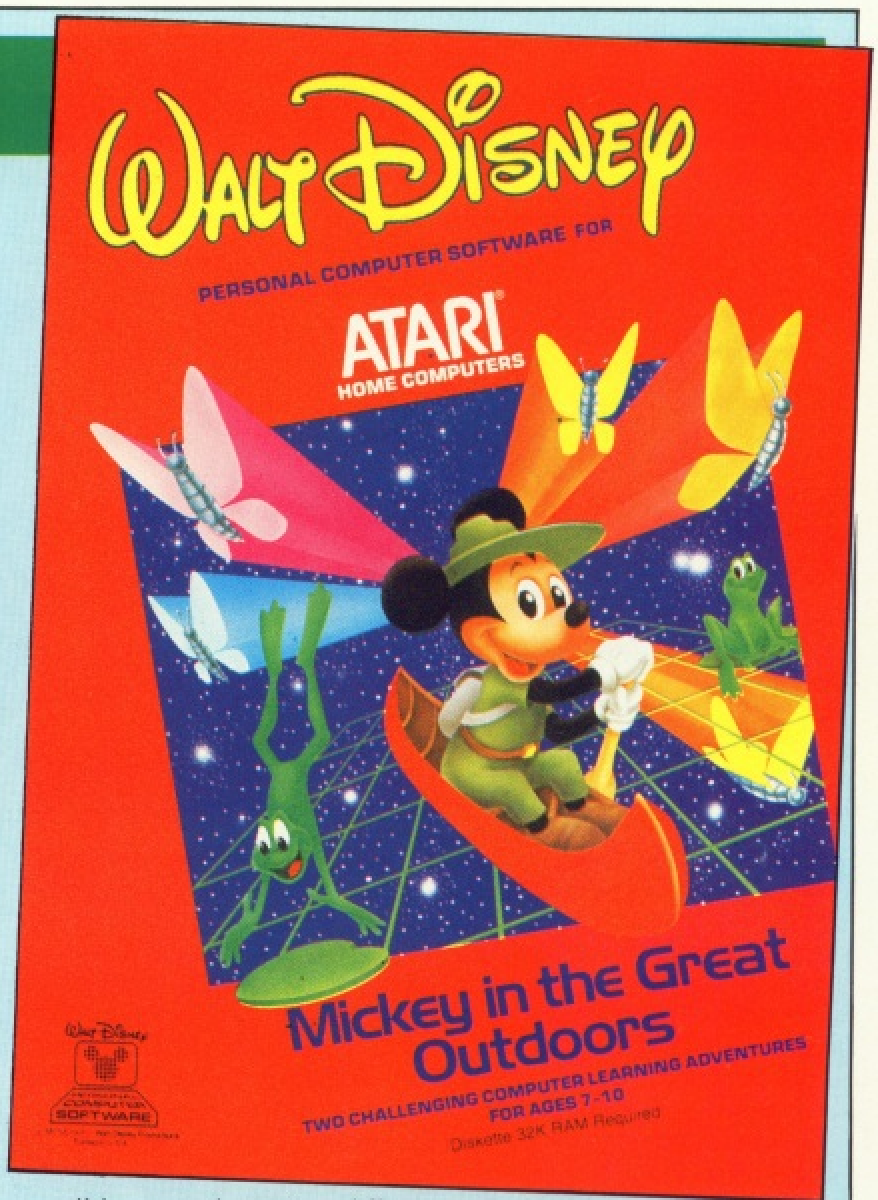
As with nearly all car racing games this one uses a front-on perspective for all the action. You control your car using a joystick plugged into port one. Pushing forward will accelerate your vehicle and pulling back decelerates it. Left and right move the vehicle in that direction.

The main screen is split into three major sections. At the top is your time left to complete a course and your speed in mph. At the bottom is the scrolling road you drive along and sandwiched between them is the landscape.

The actual race is split into three stages, each of which must be completed within the time limit in order to qualify for the next stage. Take care to avoid oncoming traffic, puddles







the pattern – for example, 2, 4, 6, 8, ? – you build a firm foundation for moving on to more sophisticated mathematical principles.

In the detailed manual there is a section detailing several non-computer based activities you can do with your child to further enhance their language and math skills. I found them particularly interesting and great fun when I tried them with my children.

Their favourite game is *I'm Back* in which I drew numbers and multiplication signs on their backs with my index finger. They had to work the answer out and write the answer on my back – great fun for the kids.

Mickey in the Great Outdoors is an excellent package. Well presented, superbly documented and, most importantly, very educational. Some of the questions asked are quite difficult, but you can get around them with a bit of parental contribution.

Because Mickey Mouse is a well known character children of all ages will be able to relate to him and enjoy the activities all the more.

The only minor problem is a few American spellings.

Sound	6
Graphics	7
Learnability	8
Value for money	7
Overall	7

and trees by the roadside if you want to complete the run. Your car doesn't explode when you hit these obstacles, you just decelerate and lose valuable time.

On completion of the race your score is calculated by the amount of time left after each stage. Should you fail to complete stage one, your score will be zero.

Screen scrolling is quite smooth, but I have seen better. Sound effects are unimaginitive and rather dull. The car looks like a flattened dustbin on wheels – it accelerates like one, too.

All in all I found California Run an average car game. Not very spectacular and old hat. The only thing it has going for it is its low price.

Sound	4
Graphics	4
Playability	5
Value for money	5
Overall	4



The Atari 520STFM



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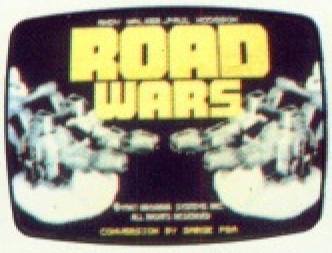
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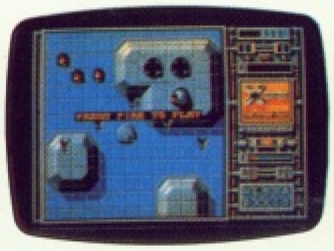
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BLACK LA

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AU/11

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ATARI
SUPER PACK

GONE TO THE DOGS

Now experience the thrill of greyhound racing with DAVE SHAKESPEARE's game

MAN has always had the urge to gamble. To satisfy this addiction he has bet on everything from the outcome of two small white cubes with dots on rolling across a table to watching man's best friend running round a race track.

Unfortunately, you need money to gamble and in this day and age that's getting scarcer all the time. So I have devised this game to satisfy addicts' needs – without emptying their wallets.

Type in the listing and check it with GIR II before saving it to tape or disc. Once this is done you can run it. After a short initialisation period you will be presented with the title screen and a prompt to enter the number of players participating – this will be asked for only when first run.

On pressing Start the game passes to the Form screen, which displays six dogs and their individual trap numbers along with recent form. The next screen is the Betting and Odds page. Each player is asked to enter his or her name – up to a maximum of nine letters – and they are assigned £100 pounds each with which to play.

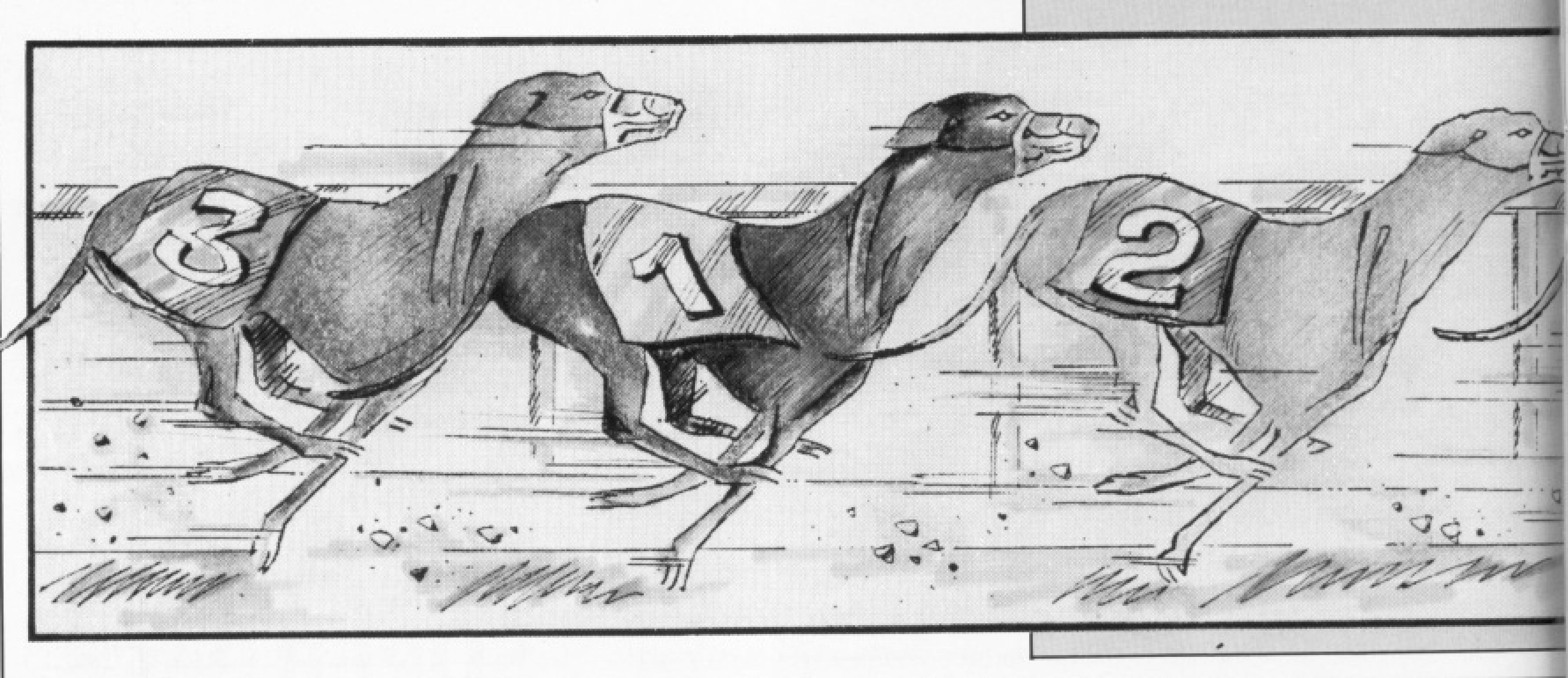
Then each player is prompted to enter the trap number of the dog he thinks will win and his bet – which must be in multiples of £10, up to a maximum of £90.

All bets placed will be displayed and the race will begin. Each race lasts a random number of laps – from one to four. However, if you want every race to last for only one lap, change line 505 to read:

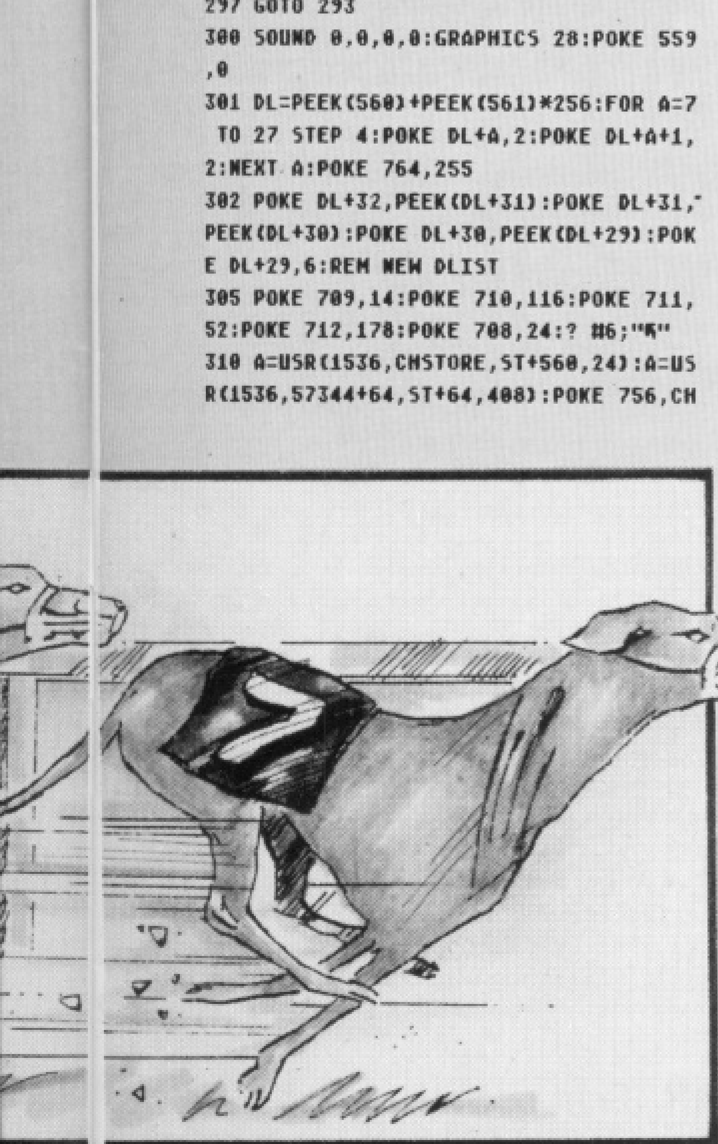
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505 LAP=1
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At the end of the race the winners and their winnings are shown and the program will loop back to the Forms screen.

```
1 REM GONE TO THE DOGS
2 REM BY DAVE SHAKESPEARE
3 REM (c)ATARI USER
10 POKE 710,0:? "▜Please wait a few se
conds.......":FOR DEL=1 TO 1000:NEXT D
EL:POKE 559,0
20 POKE 106,PEEK(106)-9:CHBASE=PEEK(10
6)+1:CHSTORE=PEEK(106)+5:REM SET UP SA
FE AREA FOR NEW CHARSET & DATA STORE
30 DIM JACKET$(11),F$(38),FM(6),NAME$(
90),NAM$(10),BET(9),ODDS(6),DOG(9),HOR
IZ(6),L(6),INC(6),DR(9),CASH(9)
40 DIM TRACK$(35),FENCE$(38),WALL1$(38
),WALL2$(38),BLANK$(20):TRACK$(1)="▛":
TRACK$(35)="▛":TRACK$(2)=TRACK$
50 FENCE$(1)="▜":FENCE$(38)="▜":FENCE$
(2)=FENCE$:WALL1$(1)="▀":WALL1$(38)="▝
":WALL1$(2)=WALL1$
60 WALL2$(1)="▗ ":WALL2$(38)="▗ ":WALL2$
(2)=WALL2$:BLANK$(1)=" ":BLANK$(20)="
":BLANK$(2)=BLANK$
70 NAME$(1)=" ":NAME$(90)=" ":NAME$(2)
=NAME$:FOR A=1 TO 9:BET(A)=0:DR(A)=0:N
EXT A:FOR A=1 TO 6:HORIZ(A)=2:NEXT A
75 W=0:IF R=1 THEN 200
80 ST=CHBASE*256:CHSTORE=CHSTORE*256
90 POKE 731,1
130 REM READ NEW CHARSET ETC.
140 FOR A=1 TO 6:L(A)=1:NEXT A
150 FOR A=0 TO 86:READ B:POKE 1536+A,B
:NEXT A
160 FOR A=0 TO 20:READ B:POKE 1636+A,B
:NEXT A:REM DLI ROUTINE INTO PAGE 6
170 FOR A=520 TO 559:READ B:POKE ST+A,
B:NEXT A:REM READ DATA FOR HORSES BODI
ES INTO NEW CHARSET
180 FOR A=0 TO 247:READ B:POKE CHSTORE
+A,B:NEXT A:REM STORE LEG MOVEMENTS IN
TO DATA STOREAGE AREA
190 FOR A=776 TO 847:READ B:POKE ST+A,
B:NEXT A:FOR A=872 TO 887:READ B:POKE
ST+A,B:NEXT A:REM NUMBERS AND LETTERS
199 REM TITLE SCREEN
200 GRAPHICS 17:POKE 712,82:POKE 710,1
98
210 DL=PEEK(560)+PEEK(561)*256:POKE DL
+3,71:POKE DL+15,7:REM 2 GRAPHICS 2 LI
```



```
NES
220 POSITION 2,0:? #6;"GONE TO THE DOG
S":POSITION 9,2:? #6;"by"
230 POSITION 2,4:? #6;"dave shakespear
e":POSITION 2,5:? #6;"for |atari user|
"
235 POSITION 2,7:? #6;"EACH PLAYER WIL
L":POSITION 6,8:? #6;"RECEIVE"
240 POSITION 5,10:? #6;"r44 pounds":PO
SITION 5,11:? #6;"AS A STAKE":REM r=CO
NTROL+Q:4=CONTROL+P
245 IF R>0 THEN 275
250 POSITION 1,14:? #6;"PLEASE enter N
UMBER":POSITION 2,15:? #6;"OF PUNTERS
(1-9)?"
260 CLOSE #1:OPEN #1,4,0,"K:":GET #1,N
:N=N-48
270 IF N<1 OR N>9 THEN SOUND 0,100,2,1
0:FOR DEL=1 TO 100:NEXT DEL:SOUND 0,0,
0,0:GOTO 260
272 POSITION 0,14:? #6;BLANK$:POSITION
 0,15:? #6;BLANK$
275 POSITION 0,15:? #6;"number of punt
ers4 ";N:POSITION 2,20:? #6;"PRESS -ST
ART- FOR"
280 POSITION 3,21:? #6;"RUNNERS & FORM
"
285 FOR A=1 TO N:CASH(A)=100:NEXT A
290 RESTORE 29000
293 READ A,B:IF B<-1 THEN POKE 711,14*
(PEEK(711)=0):GOTO 293
295 ON B=-1 GOTO 290:SOUND 0,A,10,10:F
OR DEL=1 TO B:ON PEEK(53279)=6 GOTO 30
0:NEXT DEL
297 GOTO 293
300 SOUND 0,0,0,0:GRAPHICS 28:POKE 559
,0
301 DL=PEEK(560)+PEEK(561)*256:FOR A=7
 TO 27 STEP 4:POKE DL+A,2:POKE DL+A+1,
2:NEXT A:POKE 764,255
302 POKE DL+32,PEEK(DL+31):POKE DL+31,
PEEK(DL+30):POKE DL+30,PEEK(DL+29):POK
E DL+29,6:REM NEW DLIST
305 POKE 709,14:POKE 710,116:POKE 711,
52:POKE 712,178:POKE 708,24:? #6;"K"
310 A=USR(1536,CHSTORE,ST+560,24):A=US
R(1536,57344+64,ST+64,408):POKE 756,CH
```

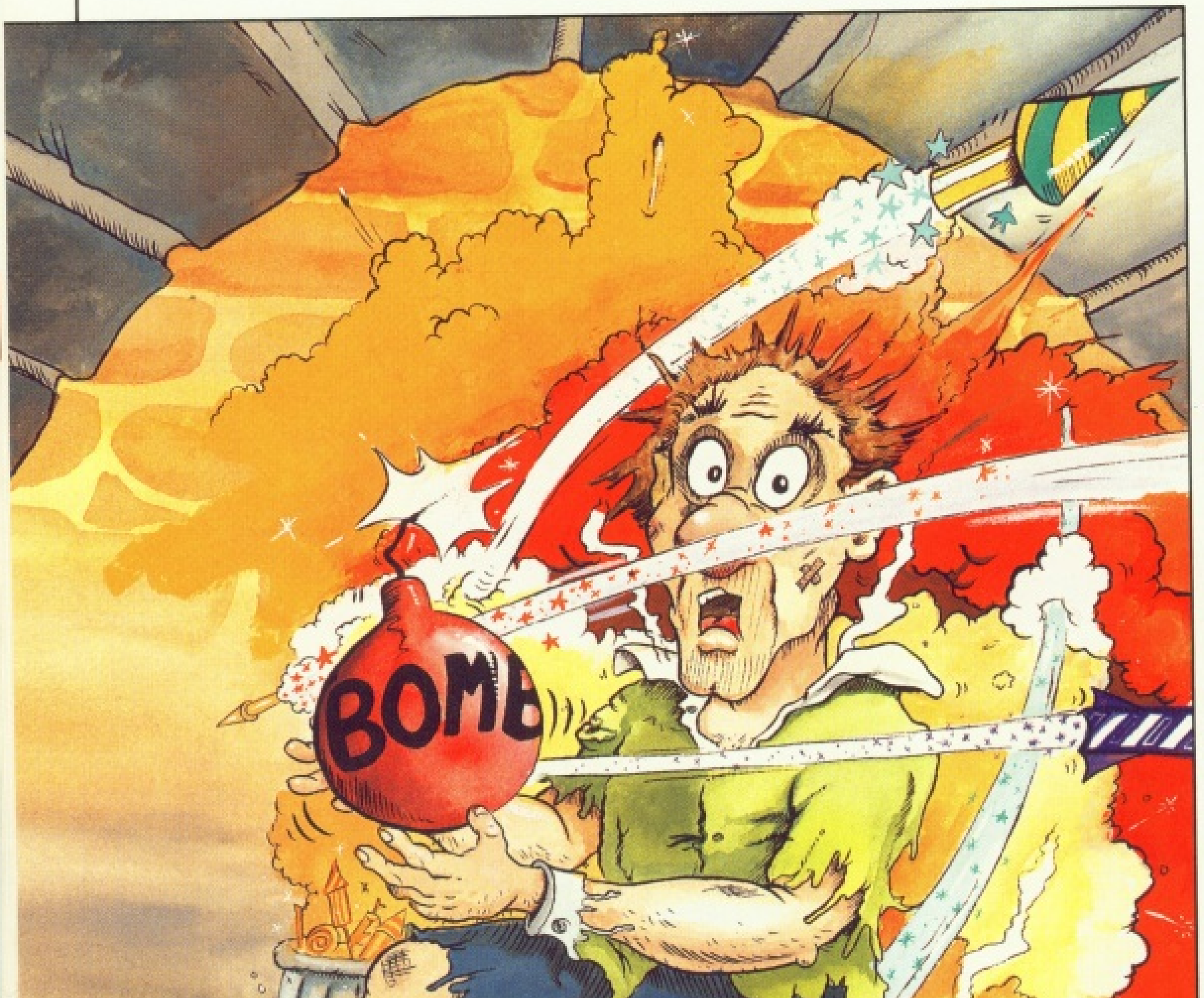


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BASE:REM SHAPES INTO CHARSET
320 POKE 512,100:POKE 513,6:POKE 54286
,192:POKE DL+16,PEEK(DL+16)+128:REM SE
T UP DLI
329 REM SET UP SCREEN
330 FOR A=0 TO 20 STEP 4:POSITION 19,A
:? #6;"|";CHR$(2+130*(A=0)+2*(A=4 OR A
=16)+131*(A=20));"J"
340 POSITION 19,A+1:? #6;"/\_/":NEXT A
345 RESTORE 20130:REM READ DETAILS OF
RUNNERS
350 FOR A=2 TO 22 STEP 4:READ B,JACKET
$:POSITION 1,A:? #6;"TRAP ";B;" (";JAC
KET$;" JACKET)":NEXT A
359 REM CHOOSE FORM OF DOGS
360 FOR A=3 TO 23 STEP 4:F=INT(RND(0)*
10):RESTORE 20200+F:READ F$:POSITION 1
,A:? #6;F$:FM((A+1)/4)=F+1:NEXT A
364 REM WORK OUT ODDS TO 1
365 FOR A=1 TO 6:INC(A)=0:INC(A)=(FM(A
)=1)+0.64*(FM(A)=2)+0.8*(FM(A)=3)+0.65
*(FM(A)=6)
366 IF INC(A)=0 THEN INC(A)=(RND(0)+2)
/3-0.16
367 NEXT A
369 REM MOVE SCREEN POINTER FOR EXTRA
LINE
370 POKE 88,PEEK(88)-64:POKE 89,PEEK(8
9)+4:POSITION 2,0:? #6;"start to conti
nue":POKE 559,34
380 RESTORE 30000
385 READ A,B:IF B=-1 THEN 380
390 SOUND 0,A,10,10:FOR DEL=1 TO B:IF
PEEK(53279)=6 THEN POP :GOTO 500
400 NEXT DEL:GOTO 385
499 REM BETTING AND ODDS
500 SOUND 0,0,0,0:GRAPHICS 17:POKE 712
,82:POSITION 2,0:? #6;"betting and odd
s"
505 LAP=INT(RND(0)*4)+1:REM CHOOSE NUM
BER OF LAPS (1-4)
510 POSITION 1,2:? #6;"THIS RACE IS ";
LAP;" LAPS"
519 REM DETAILS OF DOGS AND ODDS
520 FOR A=4 TO 9:POSITION 0,A:? #6;"TR
AP ";A-3;"  odds ";:ODDS(A-3)=0
530 IF FM(A-3)=1 THEN ODDS(A-3)=(LAP<3
)+3*(LAP=3)+10*(LAP=4)
535 IF FM(A-3)=2 THEN ODDS(A-3)=10*(LA
P<4)-5*(LAP=2)+3*(LAP=4)
540 IF FM(A-3)=3 THEN ODDS(A-3)=3*(LAP
<4)-2*(LAP=2)+5*(LAP=4)
545 IF FM(A-3)=6 THEN ODDS(A-3)=10*(LA
P<4)+(LAP=4)
550 IF ODDS(A-3)=0 THEN ODDS(A-3)
=INT( RND(0)*7)+5:IF ODDS(A-3)>10
THEN ODDS(A-3)=20
560 IF ODDS(A-3)<10 THEN ? #6;" ";
570 ? #6;ODDS(A-3);" TO 1":NEXT A
599 REM IF NEW GAME, ENTER PLAYERS' NA
MES
600 IF R=0 THEN FOR A=1 TO N:GOSUB 500
0:NEXT A:POSITION 0,12:? #6;BLANK$:R=1
609 REM PRINT NAME OF PLAYER
610 FOR A=1 TO N:NAM$=""
615 IF CASH(A)=0 THEN A=A+1:ON A>N GOT
O 860:GOTO 615
620 FOR B=1 TO 9:IF NAME$((A-1)*10+B)<
"A" THEN POP :GOTO 650
630 NAM$(B,B)=NAME$((A-1)*10+B):NEXT B
650 POSITION (19-(LEN(NAM$)+4))/2,11:?
 #6;"O.K.":NAM$:POSITION 3,12:? #6:"pl
ace your bet"
660 POSITION 3,13:? #6;"YOUR KITTY IS"
:POSITION 7-(CASH(A)>9999)-(CASH(A)>99
9)-(CASH(A)>99)-(CASH(A)>9),14
665 ? #6;CASH(A):" POUNDS"
670 POSITION 1,16:? #6:"choose trap nu
mber"
680 CLOSE #1:OPEN #1.4.0,"K:":GET #1,Q
:Q=Q-48:IF Q<1 OR Q>6 THEN 680
685 SOUND 0,Q*30,10,8
690 DOG(A)=Q:POSITION 0.16:? #6:BLANK$
:POSITION 0,21:? #6;"TRAP ";Q
699 REM GET BET
700 POSITION 1,16:? #6:"o_k_ now enter
 your bet in multiples":SOUND 0,0,0,0:
REM _=CONTROL+N
710 POSITION 4.18:? #6;"of r4 pounds":
REM CONTROL+Q & CONTROL+P
720 POKE 764,255:IF PEEK(764)<>255 THE
N 720
730 POSITION 10,21:? #6;"BET=";BET(A)
740 CLOSE #1:OPEN #1,4,0,"K:":GET #1,B
:B=B-48:BET(A)=B*10
750 IF BET(A)>CASH(A) OR B<0 OR B>9 TH
EN SOUND 0,100,2,10:FOR DEL=1 TO 5:NEX
T DEL:SOUND 0,0,0,0:GOTO 740
760 SOUND 0,B*25,10,8
770 POSITION 14,21:? #6;BET(A)
800 POSITION 0,16:? #6;BLANK$:POSITION
 0,18:? #6;BLANK$:CASH(A)=CASH(A)-BET(
A):SOUND 0,0,0,0
810 POSITION 6-(CASH(A)>9999)-(CASH(A)
>999)-(CASH(A)>99)-(CASH(A)>9),14:? #6
;" ";CASH(A)
820 POSITION 0,12:? #6;BLANK$:POSITION
 0,17:? #6;BLANK$
830 FOR DEL=1 TO 300:NEXT DEL
840 POSITION (19-(LEN(NAM$)+4))/2,11:?
 #6;"            ":POSITION 0,13:? #6;
BLANK$
850 POSITION 0,14:? #6;BLANK$:POSITION
 0,21:? #6;BLANK$
859 REM PRINT OUT NAMES AND BETS
860 NEXT A:? #6;"K"
870 POSITION 2,0:? #6;"all bets are no
w       placed"
880 B=4:FOR A=1 TO N:POSITION 0,B:IF B
ET(A)=0 THEN 900
890 ? #6;NAME$((A*10)-9,A*10):POSITION
 5,B+1:? #6;"dog ";DOG(A);" bet ";BET(
A):B=B+2
900 NEXT A:POSITION 1,2+(A*2):? #6;"TH
E DOGS ARE READY":POSITION 7,3+(A*2):?
 #6;"TO RUN"
910 RESTORE 30100
920 READ A,C,B:IF B=-1 THEN GOTO 3000
930 SOUND 0,A,10,10:SOUND 1,C,10,10:FO
R DEL=1 TO B:NEXT DEL:GOTO 920
2999 REM RACE SCREEN SET-UP
3000 GRAPHICS 28:POKE 559,0:POKE 756,C
HBASE
3020 POKE 708,24:POKE 712.178:POKE 709
,52:POKE 710,148:POKE 711,14
3030 DL=PEEK(560)+PEEK(561)*256:POKE 5
12,100:POKE 513,6:POKE 54286,192:POKE
DL+14,PEEK(DL+14)+128:REM SET UP DLI
```

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GUNPOWDER CHARLIE

Bonfire night has an explosive ending when you play STEPHEN BROUMLEY's fun game



THE party was a huge success. Bonfire Night has never been such fun. Then the morning after arrives and you have to tidy everything up. Into the bags with the rubbish and then down into your cellar to the rubbish bins. As you near the bottom you hear something going tick...tick...tick.

Somebody has activated your collection of experimental bombs and scattered them all around the cellar. Now you have to defuse them all without blowing yourself up. Luckily you know a little about explosives – they don't call you Gunpowder Charlie for nothing – so it shouldn't be too difficult.

Using your incredible jumping skills you bounce around the various levels of the cellar defusing the bombs. This may sound easy but the tricky little devil who planted the bombs has also laid a number of booby traps.

They come in the shape of huge rockets which fly randomly around the screen; if they hit you there will be a large bang. There is also a timer counting down the precious seconds you have left to complete a level.

You control Charlie through the four main screens and four puzzle screens using a joystick plugged into port one. You press fire to control the duration of Charlie's leap. You can also pause the game at any time by pressing the spacebar.

Save and Run

You get 10 points every time you defuse a bomb and after completing a screen you are awarded a bonus depending upon the amount of time remaining.

After typing in the listing make sure you save a copy before running it, and remember to check it with Get it Right! When all is well you can run the program.

You are presented with two options – disc or tape save. If you choose the former you must insert a blank formatted disc with Dos on it into drive one. Press D and an AUTORUN .SYS file will be written to it. Now all you have to do to load the game is turn the computer off and then on and the game will automatically load and run.

If you choose to create an autoboot cassette you must insert a blank, fully-rewound tape into your recorder and press Play and Record. Press C and your autoboot version will be created. To load it you hold down Start and Option while switching your micro on. Rewind the tape and press Play followed by Return to load and run Gunpowder Charlie automatically.

```
1 REM *************************
2 REM * 'GUN POWDER CHARLIE' *
3 REM * BY STEPHEN  BROUMLEY *
4 REM * COPYRIGHT ATARI USER *
5 REM *     NOVEMBER 1988    *
6 REM *************************
10 GRAPHICS 0:POKE 710,0:POKE 752,1
20 DIM A$(1),F$(20):CK=0
30 POSITION 18,6:? "PRESS"
40 POSITION 6,8:? "[C] TO CREATE A CASSETTE BOOT"
50 POSITION 5,10:? "[D] TO CREATE A DISK AUTORUN.SYS"
60 OPEN #1,4,0,"K:"
70 GET #1,KEY
80 IF KEY<67 OR KEY>68 THEN 70
90 IF KEY=67 THEN F$="CASSETTE BOOT":RESTORE 300:POKE 764,12:GOTO 110
100 F$="D1:AUTORUN.SYS":RESTORE 410
110 CLOSE #1
120 ? CHR$(125)
130 POSITION 10,4:? "CREATING-";F$
140 OPEN #1,8,128,F$
150 READ D:IF D<>-1 THEN PUT #1,D:GOTO 150
160 RESTORE 500
170 READ D:CK=CK+D:IF D<>-1 THEN PUT #1,D:GOTO 170
180 CLOSE #1
190 POSITION 16,16:? "DATA SAVED!"
200 IF CK<>323381 THEN POSITION 4,18:? "SORRY - ERROR - PLEASE CHECK DATA"
210 END
300 REM CASSETTE HEADER
310 DATA 0,27,234,127,247,127,169,60,141,2,211,24,96,169,0,133,10,169,128,133,11,96,-1
400 REM DISK HEADER
410 DATA 255,255,0,128,103,141,-1
490 REM THE GAME DATA
500 DATA 76,200,136,112,112,240,196,0,114,132,132,132,132,132,132,132,132,132,132,132,132,132,132
510 DATA 132,132,132,132,132,132,132,132,134,134,65,3,128,7,39,53,46,13,48,47,55,36,37,50
520 DATA 13,35,40,33,50,44,41,37,7,34,57,0,51,52,37,48,40,37,46,0,34,50,47,53
530 DATA 45,44,37,57,0,35,47,48,57,50,41,39,40,52,0,33,52,33,50,41,0,53,51,37
540 DATA 50,0,0,0,46,47,54,37,45,34,37,50,0,17,25,24,24,0,0,0,0,0,48,50
550 DATA 37,51,51,0,38,41,50,37,0,52,47,0,48,44,33,57,0,0,0,0,40,41,51,35
560 DATA 47,50,37,0,16,16,16,16,16,16,0,0,0,169,235,133,219,169,139,133,220,32,158,135
570 DATA 173,10,210,160,0,153,0,113,200,192,4,208,248,185,0,224,153,0,120,185,0,225,153,0
580 DATA 121,185,0,226,153,0,122,185,0,227,153,0,123,200,208,229,160,0,185,242,128,153,8,122
590 DATA 200,192,80,208,245,169,120,141,244,2,160,0,185,236,137,153,128,118,200,192,48,208,245,76
600 DATA 66,129,2,2,2,11,47,46,186,187,192,192,192,208,244,244,253,253,191,191,191,191,175,47
610 DATA 43,10,253,253,253,253,245,244,212,80,0,0,0,0,40,150,130,0,169,249,249,85,154,159
620 DATA 159,85,0,0,0,0,85,222,247,85,109,93,101,105,93,21,5,1,0,0,0,0,85,94
630 DATA 103,105,0,0,0,0,64,144,228,85,169,0,141,47,2,173,10,210,41,240,141,24,6,141
640 DATA 1,6,32,239,131,169,64,141,14,212,169,3,141,48,2,169,128,141,49,2,169,142,141,0
650 DATA 2,169,129,141,1,2,32,239,131,169,0,141,0,6,141,9,6,169,2,141,10,6,162,192
660 DATA 173,11,212,208,251,142,14,212,32,46,130,76,104,131,120,72,152,72,138,72,141,10,212,174
670 DATA 9,6,189,4,113,141,2,208,24,105,32,188,12,113,240,3,56,233,40,141,3,208,189,4
680 DATA 113,24,105,12,141,4,208,105,2,141,5,208,105,2,141,6,208,105,2,141,7,208,189,28
690 DATA 113,141,20,208,189,36,113,141,21,208,174,0,6,24,173,1,6,208,5,169,16,141,1,6
700 DATA 105,4,141,10,212,141,22,208,105,4,141,24,208,105,6,141,23,208,105,2,141,1,6,173
710 DATA 10,210,41,15,9,48,141,25,208,206,10,6,208,8,169,3,141,10,6,238,9,6,232,224
720 DATA 27,208,18,162,0,134,77,142,9,6,169,2,141,10,6,173,24,6,141,1,6,142,0,6
730 DATA 104,170,104,168,104,64,169,0,168,153,0,114,153,0,115,153,0,116,153,0,117,153,128,117
740 DATA 200,208,238,177,219,201,128,208,11,169,235,133,219,169,139,133,220,238,23,6,169,0,133,203
750 DATA 169,114,133,204,160,0,177,219,141,18,6,32,47,131,177,219,141,19,6,32,47,131,177,219
760 DATA 141,2,6,173,19,6,240,16,165,203,24,105,48,133,203,144,2,230,204,206,19,6,208,240
770 DATA 165,203,24,109,18,6,133,203,144,2,230,204,160,0,169,73,145,203,160,48,169,72,145,203
780 DATA 230,203,208,2,230,204,160,0,169,71,145,203,160,48,169,70,145,203,206,2,6,208,233,160
790 DATA 0,169,74,145,203,32,47,131,177,219,201,255,240,3,76,84,130,32,47,131,169,0,141,20
800 DATA 6,169,0,133,203,169,114,133,204,160,0,177,219,24,101,203,133,203,144,2,230,204,32,47
810 DATA 131,177,219,170,165,203,24,105,48,133,203,144,2,230,204,202,208,242,162,0,188,48,138,138
820 DATA 24,105,65,145,203,232,224,5,208,242,238,20,6,32,47,131,160,0,177,219,201,255,240,3
830 DATA 76,209,130,32,47,131,177,219,141,21,6,32,47,131,177,219,141,22,6,32,47,131,96,230
840 DATA 219,208,2,230,220,96,138,72,152,72,160,0,185,0,113,109,2,113,89,0,113,162,0,109
850 DATA 2,113,93,0,113,249,0,113,125,0,113,157,0,113,110,1,113,232,224,4,208,233,200,192
860 DATA 4,208,217,104,168,104,170,96,32,158,135,169,0,141,200,2,141,11,6,141,13,6,141,16
870 DATA 6,32,72,137,169,25,141,172,118,141,173,118,169,99,141,15,6,169,1,141,17,6,169,255
880 DATA 141,252,2,173,252,2,201,33,208,20,32,158,135,169,255,141,252,2,173,252,2,201,33,208
890 DATA 249,169,255,141,252,2,32,239,131,32,246,131,32,132,132,32,31,133,32,169,133,32,29,134
900 DATA 32,197,135,173,12,208,41,12,240,3,76,252,134,173,15,6,208,3,76,252,134,173,4,6
910 DATA 201,201,208,3,76,252,134,169,0,141,30,208,173,20,6,208,3,76,3,136,76,147,131,165
920 DATA 20,197,20,240,252,96,173,3,6,141,0,208,141,1,208,174,5,6,189,133,139,170,172,4
930 DATA 6,169,28,141,255,6,173,7,6,208,15,189,53,138,153,0,124,189,81,138,153,0,125,24
940 DATA 144,12,189,221,138,153,0,124,189,249,138,153,0,125,200,232,206,255,6,208,217,169,0,133
950 DATA 207,169,114,133,208,173,4,6,56,233,5,74,74,74,168,165,207,24,105,48,133,207,144,2
960 DATA 230,208,136,208,242,173,3,6,56,233,46,74,74,24,105,3,101,207,133,207,144,2,230,208
970 DATA 165,207,24,105,16,133,207,176,2,198,208,173,11,6,240,11,169,170,141,1,210,173,4,6
980 DATA 141,0,210,96,169,0,133,204,173,120,2,41,4,208,26,169,1,141,7,6,230,204,174,3
990 DATA 6,224,48,240,12,160,96,32,1,133,201,0,208,3,206,3,6,174,3,6,173,120,2,41
1000 DATA 8,208,23,230,204,169,0,141,7,6,224,200,240,12,160,98,32,1,133,201,0,208,3,238
1010 DATA 3,6,165,204,208,13,173,11,6,208,45,169,0,141,1,210,24,144,37,206,6,6,208,32
1020 DATA 173,11,6,208,12,172,5,6,185,214,139,141,1,210,140,0,210,169,3,141,6,6,206,5
1030 DATA 6,16,5,169,3,141,5,6,96,169,0,133,203,132,204,170,189,224,139,24,101,204,168,177
1040 DATA 207,201,70,208,2,230,203,232,224,6,208,236,165,203,96,173,8,6,208,58,173,4,6,56
1050 DATA 233,5,41,7,240,12,238,4,6,238,4,6,169,1,141,11,6,96,162,0,160,241,24,177
1060 DATA 207,201,70,240,1,232,200,177,207,201,70,240,1,232,224,2,208,12,238,4,6,238,4,6
1070 DATA 169,1,141,11,6,96,169,0,141,11,6,173,8,6,208,11,173,132,2,240,1,96,169,1
1080 DATA 141,8,6,169,1,141,11,6,206,4,6,206,4,6,162,0,173,132,2,240,1,232,160,49
1090 DATA 177,207,201,70,208,1,232,200,177,207,201,70,208,1,232,173,4,6,201,39,208,1,232,224
1100 DATA 0,240,5,169,0,141,8,6,96,173,14,6,240,6,206,14,6,32,175,135,173,13,6,208
1110 DATA 8,169,32,141,5,210,76,207,133,173,13,6,141,4,210,169,40,141,5,210,206,13,6,169
1120 DATA 65,133,203,162,0,188,218,139,177,207,197,203,240,14,232,224,6,208,242,230,203,165,203,201
1130 DATA 70,208,232,96,56,233,65,170,152,56,253,230,139,24,101,207,133,207,144,2,230,208,169,0
1140 DATA 170,188,48,138,145,207,232,224,5,208,246,206,20,6,173,14,6,24,105,10,141,14,6,169
1150 DATA 30,141,13,6,96,169,0,141,12,6,162,1,134,203,188,205,139,169,3,141,255,6,173,10
1160 DATA 210,89,0,123,153,0,123,200,206,255,6,208,241,32,54,131,189,44,113,
```

Turn to Page 19 ►

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REN	Renumbers your Basic programs in any line increment
DIR	Displays a directory of any drive without having to enter Dos
VAL	Converts numbers between decimal, hexadecimal and binary
GIR	Calculates and displays the useful *Atari User* checksums
LVAR	Lists all the variables used by a program and shows you where they occur
CHANGE	Alters the name of every occurrence of a variable in a program
STRIP	Reduces the size of a program by removing all REMs
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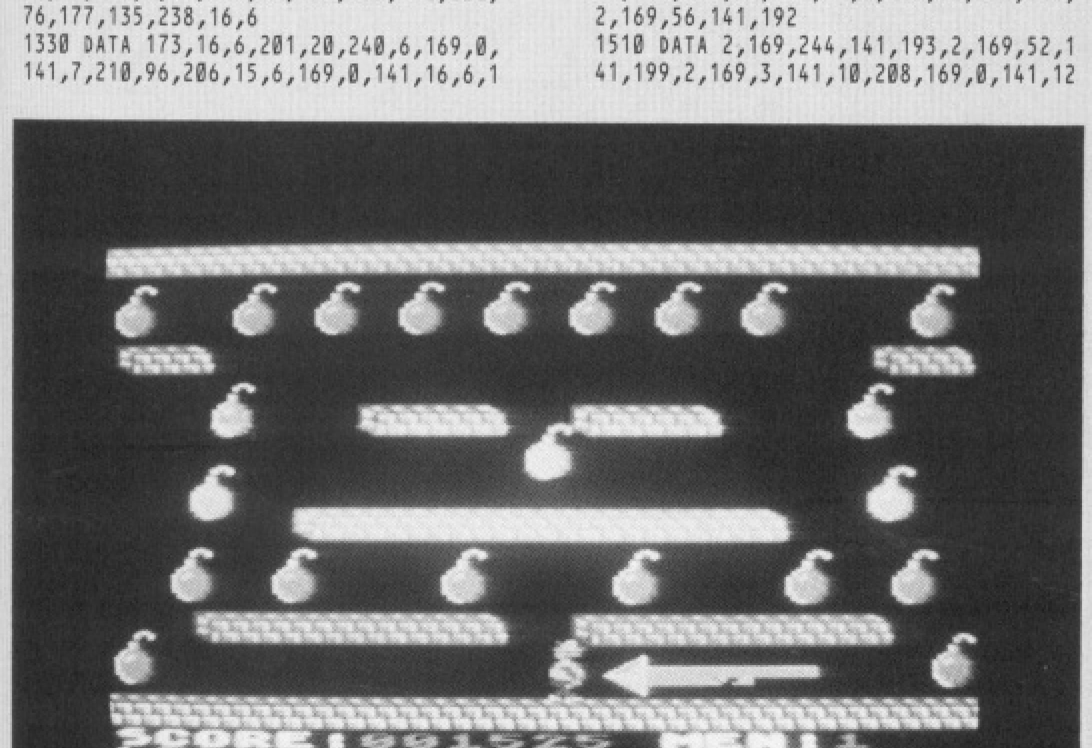
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TO ORDER PLEASE USE THE FORM ON PAGE 45

◀ From Page 17

```
240,5,222,44,113
1170 DATA 208,101,189,52,113,240,96,23
8,12,6,189,4,113,24,125,20,113,157,4,1
13,208,81,169,0
1180 DATA 157,52,113,173,10,210,41,7,1
70,189,52,113,240,10,232,224,8,208,2,1
62,1,76,105,134
1190 DATA 169,1,157,52,113,173,2,113,4
1,1,24,10,157,12,113,168,169,1,192,0,2
40,2,169,255
1200 DATA 157,20,113,173,3,113,41,240,
9,10,157,28,113,173,0,113,41,240,9,14,
157,36,113,173
1210 DATA 1,113,41,127,157,44,113,166,
203,232,224,8,240,3,76,36,134,169,1,13
3,203,166,203,160
1220 DATA 0,189,12,113,240,2,160,30,18
9,197,139,170,169,15,133,204,185,137,1
39,157,0,126,185,152
1230 DATA 139,157,0,127,232,200,198,20
4,208,238,230,203,165,203,201,8,208,21
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1240 DATA 0,173,12,6,240,2,162,2,142,3
,210,96,32,158,135,160,0,169,0,153,0,1
26,153,0
1250 DATA 127,153,0,123,200,208,242,16
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4,3,6,16,2
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2,2,73,58,141,192,2,160,14,32,239,131,
136,208,250,202,208
1270 DATA 237,162,252,169,143,141,1,21
0,142,0,210,173,3,6,41,240,201,16,240,
15,173,3,6,24
1280 DATA 101,205,141,3,6,141,0,208,14
1,1,208,32,239,131,202,202,202,202,208
,215,206,147,118,173
1290 DATA 147,118,201,16,240,3,76,104,
131,32,158,135,162,60,32,239,131,202,2
08,250,160,0,185,136
1300 DATA 118,217,148,128,208,6,200,19
2,6,208,243,24,144,13,160,0,185,136,11
8,153,148,128,200,192
1310 DATA 6,208,245,76,200,136,169,3,1
41,15,210,169,0,168,153,0,210,200,192,
9,208,248,96,162
1320 DATA 13,254,128,118,189,128,118,2
01,26,240,1,96,169,16,157,128,118,202,
76,177,135,238,16,6
1330 DATA 173,16,6,201,20,240,6,169,0,
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73,17,6
1340 DATA 141,6,210,73,23,141,17,6,169
,15,141,7,210,162,45,222,128,118,189,1
28,118,201,15,240
1350 DATA 1,96,169,25,157,128,118,202,
76,239,135,32,158,135,169,10,133,203,1
69,12,141,0,210,169
1360 DATA 15,133,203,32,175,135,198,20
3,208,249,169,15,141,1,210,32,239,131,
169,2,141,1,210,32
1370 DATA 239,131,206,173,118,173,173,
118,201,15,208,8,206,172,118,169,25,14
1,173,118,173,173,118,201
1380 DATA 16,208,204,173,172,118,201,1
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,202,208,250,162,34,254
1390 DATA 128,118,189,128,118,201,26,2
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76,87,136,112,112,112
1400 DATA 112,112,240,71,37,128,240,7,
240,7,240,7,240,7,240,7,65,109,136,72,
152,72,138,72
1410 DATA 172,0,6,162,0,24,141,10,212,
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0,140,0,6,104,170,104,168,104,64,0,48,
112,240,176,64
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,12,14,14,0,32,158,135,169,0,141,14,6
1440 DATA 141,47,2,141,218,2,141,200,2
,169,1,141,23,6,32,239,131,169,64,141,
14,212,169,109
1450 DATA 141,48,2,169,136,141,49,2,16
9,131,141,0,2,169,136,141,1,2,32,239,1
31,169,0,141
1460 DATA 0,6,169,1,141,15,6,173,11,21
2,208,251,169,192,141,14,212,169,34,14
1,47,2,32,239
1470 DATA 131,206,15,6,208,20,169,100,
141,15,6,238,0,6,173,0,6,201,6,208,5,1
69,0,141
1480 DATA 0,6,169,0,133,77,173,31,208,
41,1,208,3,76,157,128,173,132,2,208,20
9,76,157,128
1490 DATA 169,0,168,153,0,123,153,0,12
4,153,0,125,153,0,126,153,0,127,200,20
8,238,141,30,208
1500 DATA 169,120,141,7,212,169,3,141,
29,208,169,63,141,47,2,169,49,141,111,
2,169,56,141,192
1510 DATA 2,169,244,141,193,2,169,52,1
41,199,2,169,3,141,10,208,169,0,141,12
,208,173,21,6
1520 DATA 141,3,6,173,22,6,141,4,6,169
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1530 DATA 6,141,8,6,162,0,32,54,131,16
9,255,157,4,113,169,1,157,20,113,173,2
,113,157,44
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08,101
1570 DATA 118,101,108,90,16,16,17,0,0,
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,3
1580 DATA 48,49,50,51,96,97,98,99,144,
145,146,147,192,193,194,195,48,49,96,9
7,1,0,0,12
1590 DATA 28,28,62,52,62,48,24,24,60,3
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0
1600 DATA 0,0,0,44,60,61,126,8,0,12,0,
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24,24,24
1610 DATA 24,24,28,0,0,0,0,0,12,28,28,
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1620 DATA 6,8,0,0,0,64,110,0,0,0,0,0,4
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1630 DATA 127,127,127,120,120,60,24,56
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,62,48
1640 DATA 24,24,60,36,98,112,123,63,0,
4,8,0,1,129,66,0,0,0,0,0,0,44,60,61
1650 DATA 126,8,0,12,0,60,126,126,127,
127,124,124,126,126,60,56,109,199,66,0
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1660 DATA 56,56,124,44,124,12,24,24,60
,36,102,102,102,100,24,56,16,0,0,0,0,0
,56,0
1670 DATA 0,0,0,52,60,188,126,16,0,48,
0,60,126,126,126,254,254,254,102,102,6
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1680 DATA 24,24,56,0,0,0,0,0,48,56,56,
124,44,124,12,24,24,60,36,102,78,78,28
,96
1690 DATA 96,16,0,0,0,2,118,0,0,0,0,0,
52,60,188,126,16,0,48,0,60,126,126,126
1700 DATA 254,254,254,30,30,60,24,28,6
0,54,118,0,0,0,0,0,0,48,56,56,124,44,1
24,12
1710 DATA 24,24,60,36,70,14,222,252,0,
32,16,0,128,129,66,0,0,0,0,0,0,52,60,1
88
1720 DATA 126,16,0,48,0,60,126,126,254
,254,62,62,126,126,60,28,182,227,66,0,
0,0,56,112
1730 DATA 56,0,0,0,0,255,255,255,255,7
,7,7,0,0,0,0,128,192,160,208,232,244,2
50,255
1740 DATA 254,252,248,240,224,192,128,
0,0,0,0,255,255,255,255,224,224,224,0,
0,0,0,1,3
1750 DATA 5,11,23,47,95,255,127,63,31,
15,7,3,1,0,52,76,100,124,148,172,196,0
,60,84
1760 DATA 108,132,156,180,204,228,3,14
,1,6,97,98,145,146,193,194,0,48,96,1,4
9,97,48,49
1770 DATA 96,97,1,0,0,48,0,22,48,7,16,
10,31,16,10,16,8,16,255,18,3,22,3,26
1780 DATA 3,30,3,8,11,12,11,16,11,32,1
1,36,11,40,11,22,10,26,10,6,19,11,19,1
6
1790 DATA 19,21,19,26,19,31,19,36,19,4
```



Get rid of the bombs . . . but watch out for the rocket

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```
1,19,4,2,42,2,255,127,77,24,12,1,255,2
4,3
1800 DATA 24,18,255,128,109,0,22,48,0,
0,48,8,18,14,26,18,14,13,13,22,16,8,6,
26
1810 DATA 8,6,4,5,4,40,5,4,255,4,2,10,
2,14,2,18,2,22,2,26,2,30,2,34
1820 DATA 2,42,2,9,7,39,7,8,11,40,11,7
,15,41,15,24,15,24,9,12,15,20,15,28
1830 DATA 15,36,15,4,19,43,19,255,128,
189,0,6,10,0,22,10,38,6,10,38,22,10,25
5,38
1840 DATA 19,38,3,9,19,9,3,24,17,255,5
0,43,0,0,48,0,22,48,11,18,4,15,13,3
1850 DATA 6,7,2,36,8,4,22,5,5,25,19,3,
41,15,2,29,11,3,36,18,3,255,6,4
1860 DATA 24,2,37,3,14,2,18,4,13,7,19,
10,4,14,33,18,19,15,4,19,42,19,24,8
1870 DATA 27,14,11,15,38,15,20,19,42,9
,30,6,8,11,34,11,255,97,117,24,4,1,255
,20
1880 DATA 8,26,12,20,16,26,20,255,128,
43,0,0,48,0,22,48,8,12,1,17,13,1,21,9
1890 DATA 1,29,5,1,4,17,1,7,5,1,13,18,
1,15,7,1,23,16,1,27,10,1,30,18
1900 DATA 1,34,14,1,37,8,1,41,16,1,255
,8,9,17,10,21,6,29,2,4,14,7,2,13
1910 DATA 15,15,4,23,13,27,7,30,15,34,
11,37,5,41,13,255,74,173,5,10,1,11,10,
1
1920 DATA 17,10,1,23,10,1,29,10,1,35,1
0,1,41,10,1,255,4,20,41,7,255,52,93,12
8
1930 DATA 224,2,225,2,0,128,-1
```

Get it right!

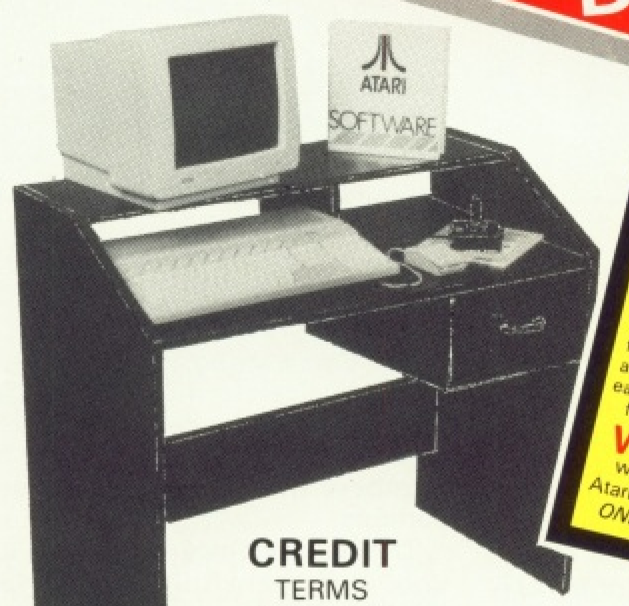
LINE CHSUM	LINE CHSUM	LINE CHSUM	LINE CHSUM	LINE CHSUM	LINE CHSUM
1 CAJ (W)	410 HUE (F)	780 J52 (5)	1080 RPK (7)	1380 UUV (Y)	1680 QSU (Q)
2 CAK (3)	490 DYV (1)	790 CL1 (7)	1090 GQD (W)	1390 GP5 (Y)	1690 RC4 (V)
3 CAL (V)	500 UJ8 (4)	800 JPR (F)	1100 W7J (P)	1400 4P8 (G)	1700 R3N (R)
4 CAM (4)	510 7Y8 (G)	810 LMH (Q)	1110 48R (G)	1410 END (3)	1710 PSD (8)
5 CAN (W)	520 SM7 (P)	820 GWE (7)	1120 U6V (9)	1420 AFG (O)	1720 4K6 (E)
6 CAP (7)	530 RTQ (W)	830 CUK (P)	1130 H3F (U)	1430 K22 (Q)	1730 OMV (L)
10 67E (3)	540 CYJ (K)	840 58S (G)	1140 FX9 (6)	1440 F2G (G)	1740 Y8R (F)
20 3DF (1)	550 DFW (N)	850 3FM (P)	1150 3C7 (2)	1450 4VM (R)	1750 17F (D)
30 GTL (L)	560 79U (X)	860 884 (5)	1160 GFN (V)	1460 4QT (Q)	1760 532 (E)
40 PLN (O)	570 6KU (P)	870 GY7 (9)	1170 F89 (Y)	1470 2RT (3)	1770 KL3 (6)
50 DLS (4)	580 LPK (Y)	880 HJ4 (R)	1180 G7U (9)	1480 53Q (Q)	1780 R4Q (Q)
60 1XR (2)	590 Q1E (F)	890 LUT (8)	1190 6KS (J)	1490 FC5 (F)	1790 SQT (R)
70 SYF (N)	600 KRH (H)	900 6NK (C)	1200 8JE (W)	1500 HG9 (Y)	1800 SRU (R)
80 UUK (P)	610 657 (4)	910 5TM (9)	1210 EAR (8)	1510 7CA (A)	1810 8EA (9)
90 6C3 (G)	620 R6F (8)	920 326 (W)	1220 LDP (5)	1520 S46 (X)	1820 DL8 (9)
100 7HH (K)	630 6PO (O)	930 6GA (T)	1230 H42 (W)	1530 34Q (D)	1830 R61 (6)
110 M28 (5)	640 77F (M)	940 KX6 (F)	1240 387 (9)	1540 9QU (J)	1840 AWV (T)
120 NVU (8)	650 XUD (2)	950 GT6 (S)	1250 O2X (P)	1550 5PT (3)	1850 DFM (P)
130 42P (G)	660 LRQ (X)	960 GCT (N)	1260 HGX (K)	1560 WP9 (5)	1860 DKH (Y)
140 27J (K)	670 6CO (6)	970 GVQ (P)	1270 2GA (U)	1570 NKM (J)	1870 RTX (A)
150 KJ2 (N)	680 6K1 (H)	980 67V (R)	1280 H9H (D)	1580 4OG (T)	1880 L4U (J)
160 X4D (V)	690 6YF (8)	990 UFU (D)	1290 HSG (S)	1590 QPP (9)	1890 9EL (G)
170 339 (J)	700 4DK (S)	1000 3P3 (F)	1300 D9Y (4)	1600 3GD (Q)	1900 AXE (A)
180 MX8 (2)	710 293 (V)	1010 2S6 (D)	1310 JF2 (8)	1610 QLM (A)	1910 RPH (Y)
190 YYQ (R)	720 V8M (N)	1020 1W3 (G)	1320 LEF (W)	1620 961 (3)	1920 NS8 (Q)
200 NXT (P)	730 HCT (Q)	1030 DFT (3)	1330 1GE (9)	1630 VJ9 (Y)	1930 H4J (N)
210 D62 (3)	740 TY8 (X)	1040 5FL (6)	1340 HS6 (3)	1640 CL4 (H)	
300 CUU (G)	750 KDQ (F)	1050 WG6 (G)	1350 H9U (L)	1650 1C8 (P)	
310 3N7 (Y)	760 7QU (Q)	1060 3T9 (F)	1360 L84 (3)	1660 QHA (O)	
400 CUV (M)	770 NGE (S)	1070 YOL (4)	1370 SPU (V)	1670 3VN (A)	

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SOFTWARE *Solutions*

Your programming problems solved by ANDRÉ WILLEY

THE past few weeks have been pretty quiet here at *Atari User* due to the postal strike, but I've still got a few letters in hand which present some quite interesting points.

The first question comes from abroad for a change, namely Madrid in Spain, where **Klaus Estrugo Eckstein** lives.

He's been working out complex graphical formulae using his trusty Atari, but has hit a slight snag when it comes to creating the neat user-oriented front end he is attempting to design:

❝ The most useful thing the program does is to draw the x axis, y axis and graph, then it allows you to zoom in to a part of the curve in order to take a closer look, or to pull back and see the whole graph.

The main loop of the program, the one which does all the calculation and plotting of the curve, is as follows:

```
605 REM ---------------------------
610 REM Function Plotting Routine
615 REM ---------------------------
630 FOR X=U TO O STEP 0.05/F1
635 TRAP 3000
640 Y=X^2
650 A=X*20*F1+156+B2
660 B=-(Y)*20*F1+96+B1
670 IF A<1 THEN GOTO 720
680 IF A>319 THEN GOTO 730
690 IF B<1 THEN GOTO 720
700 IF B>191 THEN GOTO 720
710 PLOT A,B
720 NEXT X
730 TEXT 1,1,"f(x)=x^2"
740 FOR W=1 TO 150: SOUND 0,121,10,12:
NEXT W: SOUND 0,0,0,0
745 RETURN
750 REM ---------------------------
```

The variables U, O, B1, B2 and F1 define the scale of the graph and the portion of the curve to plot. These would be set via a number of INPUT statements according to what view I currently require.

The routine would be entered via a GOSUB command after the computer was put into Graphics 8 and the colours set accordingly.

My big problem is that whenever I want to change the main equation I have to halt the program and edit the calculations on line 640. Atari Basic, or Turbo Basic which I also use, do not have an 'evaluate string' command, such as those provided on the Commodore 128 and MSX machines.

This would allow the user to enter a string like Y=EXP(X) or Y=2(X³)+5*(X²)–10 and have the computer evaluate it like a program line.*

I first tried to use the VAL command, but it doesn't seem to work the way I wanted. Later I wrote each type of function into a special menu which would then ask the user to enter each parameter for the particular type of equation.

However this method is still limited to the choices given in the menu – and also destroys the whole fluidity of the program since whenever I want to analyse a completely new function I have to change all the equations in the whole program. This includes the text on line 735 which is output directly to the Graphics 8 screen.

How is it possible to enter a new formula into a variable or variables which will allow this kind of flexibility? ❞

● As you have correctly surmised in your most comprehensive letter, there is no simple way of telling Atari Basic to evaluate a string as though it were a mathematical formula – the closest being the VAL function, which is only capable of converting a string full of numbers into an ordinary numeric variable.

This is obviously of no real use to you, but thankfully a little lateral thinking will provide a rather elegant solution, simply by resorting to that old faithful known as Return key mode – which has cropped up once or twice before on these pages. In fact what we will create is a self modifying program.

I'll first explain how this system works, and then provide you with a practical example by way of a subroutine which could easily be modified for use in many other programs.

The first thing required is to store the formula you wish to evaluate in a string – EVAL$ in my example. This would normally be input at some other stage in your program, but I have defined a simple formula on line 10 to show how the system works.

Don't forget that whatever you type in this string must be a completely valid Basic statement – although you could try using the TRAP command to catch the Error 17 that would otherwise be created.

Once this formula is stored in string form you can start to manipulate it. Changing line 735 to contain EVAL$ is easy enough, but how do we enter the string as a command on line 640?

This is where Return key mode comes into play, and we must first put the micro back into a standard text screen for the technique to work – hence the Graphics 0 command. Next we move a couple of lines down the screen and print out the text of the modified line 640. This is done on program line 1030.

Note that the exact text you print is entirely up to you, just so long as it is

preceded by a line number (in this case 640) and is a valid Basic program line. You could even modify more than one line at a time using this method – just so long as they will all fit on to the screen.

```
10 EVAL$="SIN(X)+25"
20 GOSUB 1000
30 END
1000 REM MODIFY LINE USING RETURN-KEY
MODE
1010 GRAPHICS 0
1020 POSITION 2,3
1030 PRINT "640 LET Y=";EVAL$
1040 PRINT: PRINT "CONT"
1050 POSITION 2,0
1060 POKE 842,13: REM MODE ON
1070 STOP
1080 REM PROGRAM RE-STARTS HERE
1090 POKE 842,12: REM MODE OFF
1100 RETURN
```

Return-key mode demonstration

Next we must tell Basic what we want it to do after our new line has been accepted – which in this case is to continue running the program, hence the CONT command printed immediately after our new line.

Finally, we move the cursor back up to the top of the screen and enter the Return key mode using POKE 842,13. When the program reaches a STOP command (line 1070), the micro tries to enter each line of text from the current screen, just as though you had typed them in from the keyboard, and hence modifies line 640 accordingly. It then comes across the CONT command and continues the program where it left off.

All that remains to be done now is to de-activate Return key mode with POKE 842,12 and the job is complete – the new line 640 will have become part of the program and will execute whenever that section is used.

This technique could be extended to any type of program which requires user modification, and the only limitation is the amount of information you can fit onto a text screen in one go. If you require any more you must split it into multiple blocks with a CONT at the end of each.

Fermenting formula

Staying with pure mathematics for a while, **Stephen Pocklington** from Chieveley in Berkshire is also having problems with formulae:

❝ *I recently read in a newspaper of* Fermat's Formula, *which has remain unsolved for some time. The formula is:*

$$x^n + y^n = z^n$$

I set about writing a program on my 800XL which would go through some of the possibilities and display them on the screen.

All was going well and the program worked fine for powers of 2, for which I used the SQR function to calculate square roots. However, to work with other values of n I needed to use the general format of x ↑(1/n), which does not seem very accurate.

Using SQR(25) gives me the correct answer 5, but 25 ↑ (0.5) returns a result of 4.99999987. Please can you tell me what is wrong? Is there an alternative method or is my poor computer going senile? ❞

● What you have come acros is known as floating point inaccuracy, and it is particularly severe on the 8 bit Atari. What has happened is that the formula used to calculate the result of raising a number to a given power is not accurate enough to give a full 8 decimal places – hence the error.

Depending on the degree of accuracy you require you can get the micro to adjust the final result to round up or down to, say, six significant figures.

The best way of doing this is to first multiply the number by 100,000, round it up or down to the nearest whole number, and then divide it by 100,000 again to get back to the original value – albeit less some of the fine detail in the final couple of decimal places.

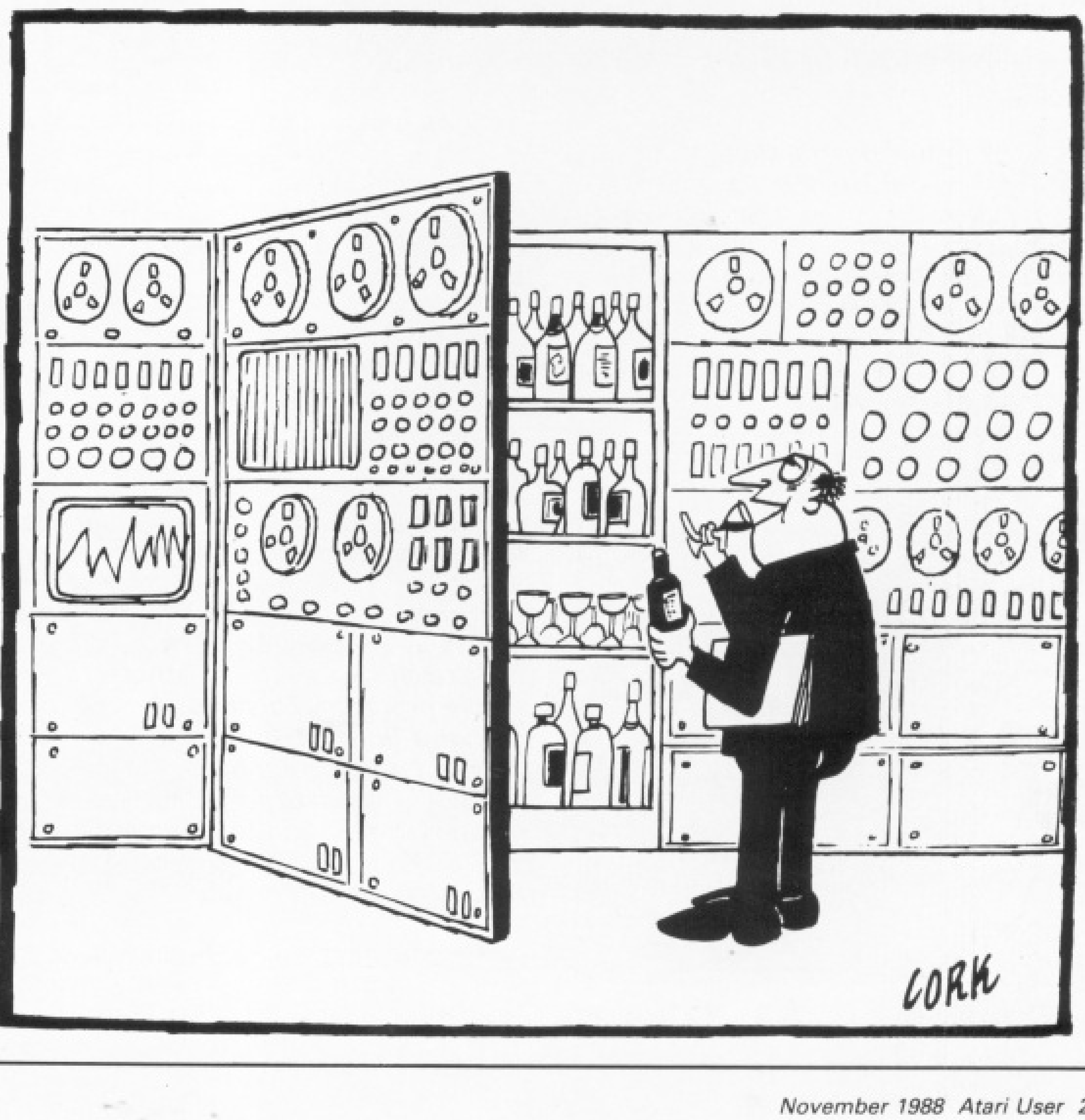
For seven significant figures you would use a multiplier of 1,000,000 instead, and for five you would use 10,000. The general format in Atari Basic is:

```
10 MULT=100000
20 NUMBER=INT(NUMBER*MULT+0.5)/MULT
```

The 0.5 added to the larger figure simply rounds any fractional part left over to the nearest whole number.

Although this will enable you to calculate the figures more easily, I think you might find the limitations of the single precision floating point system tend to give you some pretty vague results anyway – so perhaps good old Fermat's formula will remain unsolved for a little while yet.

● *Well that's about all the space I've got for this month. Now that the postal system is back into some sort of order. I trust you'll all be putting pen to paper, or printhead to paper in this day and age, and sending me lots more programming questions and problems.*



EMERALD ISLE

by Francis Phythian




N
W
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FLAT GRASSY AREA
MINE ENTRY
TREE TOP
NORTH BRIDGE
CLOCK TOWER
MAZE OF BRANCH
MAZE OF BRANCH
MAZE OF BRANCH
MAZE OF BRANCH
MAZE OF BRANCH
MAZE OF BRANCH
BRIDGE TO WOOD CITY
MAIN SQUARE
PLAZA
TREASURE ROOM
ALLEY WAY
KING'S ROOM
THROUGH ROOM
LANDING ON STAIRS
PALACE QUAD
HANGING GARDEN
PALACE YARD
BIG KITCHEN
WEST HALL
GREAT EAST HALL
DRESS CIRCLE
EMPTY ?
COPPER ROOM
TRAIN
DARK
PLAT-FORM
TICKET OFFICE
DYING WOOD
HIGH WOOD
EDGE OF WOOD
DEAD WOOD LAND
SPARSE SHRUB
RICH VEGIES
CLEAR-ING
CORPSE
SUN LIGHT
CLAMMY SHRUBS
The Woods
ATARI USER

ANDRÉ WILLEY continues his look at computer talk

RS-232 –

IF you were all paying attention last month you should by now have a fairly good understanding of how a simple RS-232 interface functions, and what its needs and limitations are.

If you recall, data is sent from the computer to a given peripheral down one wire and returned from the peripheral using a second line. There are a number of additional connections, but these are often left unused and can be discussed once the main principles are fully understood.

Unfortunately, no Atari 8 bit micro comes with an RS-232 interface, so if you want to access devices such as modems and serial printers you must first buy a separate interface box. Normally it will be Atari's own 850 module, and so we'll concentrate on this device,

The module contains its own rom-based software which loads into the micro at boot time, in much the same was as Dos loads itself from disc. You'll find in practice that many third party interface units, such as ICD's P:R: Connection, use exactly the same system – even down to the software control codes – so what follows should apply to most users.

If you are planning to use a modem, some form of communications software, such as that provided with Mini Office II, will be invaluable, but there may well be occasions on which you want to control the interface system directly. This is handled from Basic using XIO commands, but there are a few things you should understand before starting on your first RS-232 program.

Command	Parameters
OPEN #chan,aux1,aux-2,"Rn:" (initialise IOCB for use)	chan: IOCB channel number (1-7) aux1: 4 for concurrent input, 8 for block output, 9 for concurrent output, 13 for concurrent input/output (P:R: Connection uses 12 for I/O) aux2: unused (usually zero)
CLOSE #chan (close current IOCB)	chan: IOCB channel number (1-7)
GET #chan,avar (input single byte)	chan: IOCB channel number (1-7), avar: numeric variable for returned byte
INPUT #chan,var$ (input multiple bytes)	chan: IOCB channel number (1-7), var$: string variable for returned text
PUT #chan,numb (output single byte)	chan: IOCB channel number (1-7), numb: value or variable to send (0-255)
PRINT #chan;text (output multiple bytes)	chan: IOCB channel number (1-7), text: string or variable(s) to send
STATUS #chan,avar (Get current status of RS-232 link)	chan: IOCB channel number (1-7) avar: IOCB dummy variable, PEEK(746) gives error status, PEEK(747) gives handshake status when in block mode, PEEK(747)+PEEK(748)*256 gives number of bytes unread in the concurrent input buffer, PEEK(749) returns number of bytes in concurrent output buffer (See also Figure II)
XIO 32,#chan,0,0,"Rn:" (force output of short block)	chan: IOCB channel number (1-7) (Block mode only)
XIO 34,#chan,aux1,0,"Rn:" (Set control lines)	chan: IOCB channel number (1-7), aux1: Sets values for DTR, RTS and XMT (See also Figure III)
XIO 36,#chan,aux1,aux-2,"Rn:" (Set speed/stop bits/etc.)	chan: IOCB channel number (1-7), aux1: Sets baud rate & number of stop bits, aux2: Tells computer whether to monitor the CRX, CTS and DSR lines (See also Figure IV)
XIO 38,#chan,aux1,aux2,"Rn:" (Set parity/line feed/trans.)	chan: IOCB channel number (1-7), aux1: Sets translation mode, input and output parity and line-feed mode, aux2: "Won't translate" character (See also Figure V)
XIO 40,#chan,0,0,"Rn:" (Start concurrent I/O)	chan: IOCB channel number (1-7) N.B: No other XIO commands are allowed once concurrent mode is activated.

Figure I: RS-232 commands available from Basic

Distinct modes

Firstly, RS-232 is a bi-directional data transfer system. This means that bytes of data must be able to pass in either direction and, more importantly, at any time. You might, for example, have to deal with received information at the same time as transmitting your own message.

At 1200 baud this could mean up to 120 characters a second in either direction, so the software required to handle this is quite complex. More to the point, it must be monitoring the received-data line constantly so that no information is lost. This means that the micro will be completely tied up handling the RS-232 system and have no time for other types of information transfer such as to a disc drive or printer.

To get around this problem there are two distinct modes of operation for the interface – block mode and concurrent mode. The latter is used when full two way communication is required, but if you only need to send data you may select block mode, which frees enough processor time to allow any other I/O functions to take place.

In concurrent mode any information which is sent or received is dealt with

a serial in 8 bits

in real-time – as soon as you send a byte of data from your program it will be immediately transferred to the peripheral at the other end. Equally, any data coming from the peripheral will be instantly available to your program.

However, the use of concurrent mode prevents any other use of the serial I/O system – so no cassette, disc or printer operations are possible while concurrent mode is activated. Since they do not use the serial bus, internal operations such as access to the keyboard and screen are not affected.

Select your channel

Although block mode is more useful if you need to access other peripherals at the same time, two major limitations are imposed. Firstly there is no facility for the computer to receive RS-232 data from the interface – it is strictly an output-only system.

Secondly, all data sent by the computer is first stored in a temporary 32 byte buffer. This means that your data will not normally be transmitted until the block is full, and then all 32 bytes will be sent as a single block – in very much the same manner as the buffering system used for other output devices such as a cassette, printer or disc.

So much for theory, now let's see how the system works in practice. Once you've connected all your cables – and that's not always as simple as it sounds – you are ready to power up the computer and allow the interface software to boot into memory.

This is automatic for a tape system, but disc users must specify that they wish the load to take place by use of the special AUTORUN.SYS file provided on their Dos disc. If you are in doubt, listen for a long high pitched beep sound during the final stages of the boot process. This is the special R: driver loading and initialising.

You can use the R: driver in much the same way as you would any other CIO driver. All of the usual commands are available, including OPEN, CLOSE, INPUT, PRINT and so on. Also a wide range of XIO commands are used to adjust various aspects of the data transfer. Although most XIO com-

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"Are you sure you're sending the right control codes down the RS-232!"

Meaning of error bits returned by PEEK(746)		
Bit	**Decimal value**	**Meaning**
7	128	Input data framing error (no stop bit found)
6	64	Input overrun error (computer missed some bits)
5	32	Input data parity error (if parity selected)
4	16	Input buffer overflow error (too much data)
3	8	Illegal interface option requested by user
2	4	External device not ready (if monitoring is on)
1	2	Error on block data output (Atari I/O bus error)
0	1	Error in command to interface module

Meaning of bits returned by PEEK(747) in block mode only		
Bit	**Decimal value**	**Meaning**
7	128	128 means DSR shows ready (true)
6	64	Gives previous DSR status (as for bit 7)
5	32	32 means CTS shows ready (true)
4	16	Gives previous CTS status (as for bit 5)
3	8	8 means CRX shows read (true)
2	4	Gives previous CRX status (as for bit 3)
1	2	Not used
0	1	Current state of received data line (1 or 0)

Figure II: The Status command

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R235

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mands may be used without first opening a channel, it is conventional to allocate your channel number with the OPEN command before proceeding.

Four modes are available when opening a channel, block output, concurrent (real-time) output, concurrent input and concurrent input/output. These are specified using the first parameter of the OPEN command:

```
OPEN #1,8,0,"R1:"
```

In this case the number 8 is used to specify block mode output. More information is given in Figure I.

The PRINT and PUT commands work in exactly the same way as you would expect, and they may be used with channels opened for block or concurrent data transfer. On the other hand, INPUT and GET may only be used when concurrent mode is activated, but otherwise function as normal.

When you CLOSE a channel any remaining output bytes will be sent and the channel will be freed for other use, although any remaining concurrent input data will be lost.

Due to the nature of RS-232, you may wish to send data faster than the link is capable of transferring it – especially at lower baud rates. For this reason text is buffered in both directions, and if the output buffer becomes full CIO will wait until there is space before letting you send any more text.

XIO functions

The input buffer is much more important since you can't always stop the remote terminal from sending data to you, so the STATUS command is used to check the number of unread characters waiting in the input buffer.

After issuing such a STATUS command you may PEEK location 747 and 748 to give you the number of bytes currently waiting to be read. A good program should then GET or INPUT those characters until the buffer is empty. If the buffer gets too full some information may be lost, so you should check its status frequently.

When in block mode, STATUS can also be used to find the condition of the remote end of the link via the Data Set Ready, Clear To Send and Carrier Detect lines. A number of other functions are available, each controlled by its own XIO command. These are listed in greater detail in Figures I through V.

XIO 32 is only required when you are working in block mode, and it will force the software to send the current buffer contents, even if that buffer is not yet full.

XIO 34 allows you to indicate your readiness to communicate with the remote device by setting the condition of the Data Terminal Ready, Ready to Send and Data Out lines.

XIO 36 is used to set the baud rate (or speed) of communication, the number of stop bits and the number of bits sent per word (usually set to eight). This command is also used to determine what sort of control line monitoring should be undertaken

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Add one number from each table to select the current control line status:

0	Don't change DTR
128	Set DTR to Not Ready (false)
192	Set DTR to Ready (true)
0	Don't change RTS
32	Set RTS to Not Ready (false)
48	Set RTS to Ready (true)
0	Don't alter the data output line
1	Set output line to 0 (false)
2	Set output line to 1 (true)

Figure III: XIO 34: Set condition of output control lines

Add the following numbers, one from each table, to give a value for Aux1:

Value	Meaning
0	300 baud
1	45.5 baud (RTTY: 60 words per minute)
2	50 baud (RTTY: 67 words per minute)
3	56.875 baud (RTTY: 75 words per minute)
4	75 baud (RTTY: 100 words per minute)
5	110 baud
6	134.5 baud (used on some older IBM systems)
7	150 baud
8	300 baud
9	600 baud
10	1200 baud
11	1800 baud
12	2400 baud
13	4800 baud
14	9600 baud
15	9600 baud (19,200 baud with P:R: Connection)
0	8 bits per word)
16	7 bits per word) – Only 8 bits per word (that is, normal bytes)
32	6 bits per word) are available with the P:R: Connection
48	5 bits per word)
0	Add 1 stop bit
128	Add 2 stop bits

Use the following values for Aux2 to select which lines to monitor:

Value	Monitor lines			Value	Monitor lines		
0	None			4	DSR		
1			CRX	5	DSR		CRX
2		CTS		6	DSR	CTS	
3		CTS	CRX	7	DSR	CTS	CRX

Figure IV: XIO 36 Details

◀ From Page 29

before sending any data. This monitoring system works in real time, and will return an error if any of these lines should indicate Not Ready during transmission of data.

XIO 38 controls the use of parity bits, if required, as a simple method of line error detection. It also allows you to add a line-feed byte after each Return and to convert between standard Ascii codes and Atari's Atascii system.

Enable link

Finally, XIO 40 is used to enable concurrent mode on the data link. This has the effect of locking out any further changes, since all the other XIO commands will only function in block mode. If you do need to alter any settings you'll have to CLOSE the channel and start again.

● *Next month, after this has had time to sink in, I'll show you how to use the RS-232 driver to write a simple communications program which will let you experiment with online systems.*

Add the following values (one from each table) for Aux1:

Value	Output Parity
0	None
1	Set output to odd parity
2	Set output to even parity
3	Set parity bit to 1

Value	Input Parity
0	None
2	Check for odd parity and clear bit
8	Check for even parity and clear bit
12	Don't check parity, but clear parity bit anyway

Value	Translation mode
0	Light Translation (155 (Carriage Return) altered to 13)
16	Heavy Translation (155 changed for 13, plus ignore Ctrl codes)
32	Atascii Mode (No Translation)

Value	Line-Feed mode
0	Ignore
64	Add a Line-Feed after each Carriage Return

(Aux2 is the Ascii value of the character which will be returned if the Heavy Translation mode can't cope with an incoming byte.)

Figure V: XIO 38 parameters available

One that got away

by Rouloc



ONE adventure released earlier this year which I haven't told you about before is The Eternal Dagger from SSI – Strategic Simulations Inc. This is another fantasy game based very much on its close relative, Wizard's Crown. As is usual with this type of tale, an evil Necromancer has laid waste an island.

His conquest was made easier by a dragon which had stolen a holy relic from its normal resting place. You must first recover the relic from the dragon because without it you cannot hope to defeat the Necromancer and his evil army of undead.

Before you can even get down to playing the game, you must create four – yes, four – playing discs with the aid of the program: These are all needed during the whole game. That takes some time, so be patient. Then it's advisable to have at least a quick read through the detailed 30 page manual that comes with the two disc game.

Having carried out these preliminaries, you are ready to start. The game is played using the keyboard – mostly single key commands – and the good news is that plenty of on-screen prompts are provided. The bad news is that the frequent disc swapping and accessing time required takes a good deal of the fun out of the gameplay.

You commence with your adventurous band of eight characters just outside a tower. Each of your characters has a number of attributes (intelligence, strength, dexterity and so on), skills, abilities, weapons, armour and sundry other items. You may tailor any or all of your characters to build up just the sort of band you feel would fare the best in the coming adventure.

The main screen is a two dimensional map across which the characters trek. They can move in any direction, rest, search and make camp. On encountering other creatures they may elect to talk, run or fight them.

Combat can be quick – in which case the computer takes over most of the work and simply updates you on the progress of the battle – or tactical – in which case you take over all the decision making. Each round of tactical combat can take some time as many commands and movements are at your disposal.

The sound and graphics are nothing to get excited about, but are adequate for the purpose. What this game does have to offer is stacks of detailed and accessible data on every character and plenty of commands and options for you to play around with.

For instance, the combat commands allow you to ready an item, sneak, throw a weapon, turn an undead, cast any one of a vast number of spells – up to your acquired magical ability, naturally – load a bow or crossbow, defend, stand on guard, launch an aimed weapon, defensive or killing attack.

Magic spells include unlock, freeze, invisibility, fumble, fear and protection at the easier end of the spectrum with fireball, lightning bolt, magic blast, paralyse and life steal at the tougher end of the spell range. Prayers can be invoked to heal and help the band in a number of ways.

There are towns where you can visit the market place to buy and sell, the temple to pray and restore your characters' karma, inns to carouse, eavesdrop and rest, docks to catch a ship, money changers to swap your less valuable coins for gold, the enchanter's shop to buy magic items and the alchemist's to create magic potions.

There are also dungeons to be explored, and here you can search, cast Foxfire or Night Vision – so you can all see in the dark of course – open and close doors and generally try to find what you can. Be very cautious here as these underground labyrinths are deadly. Numerous traps and monsters wait for you around every corner.

The Eternal Dagger has plenty in it – a vast land to explore, loads of characters, masses of stats and information and battles by the bagful. However, it is very similar to other games of this nature and you could be forgiven for thinking that when you've seen several, you've seen them all.

One of the drawbacks with a large game such as this is the constant disc swapping which is a real pain and slows down the action almost to the point of annoyance.

However, the SSI games have a large following and for those who enjoy this type of fantasy cum strategy game, Eternal Dagger is not likely to disappoint.

Until next month, keep your knapsack full and your sword arm strong.

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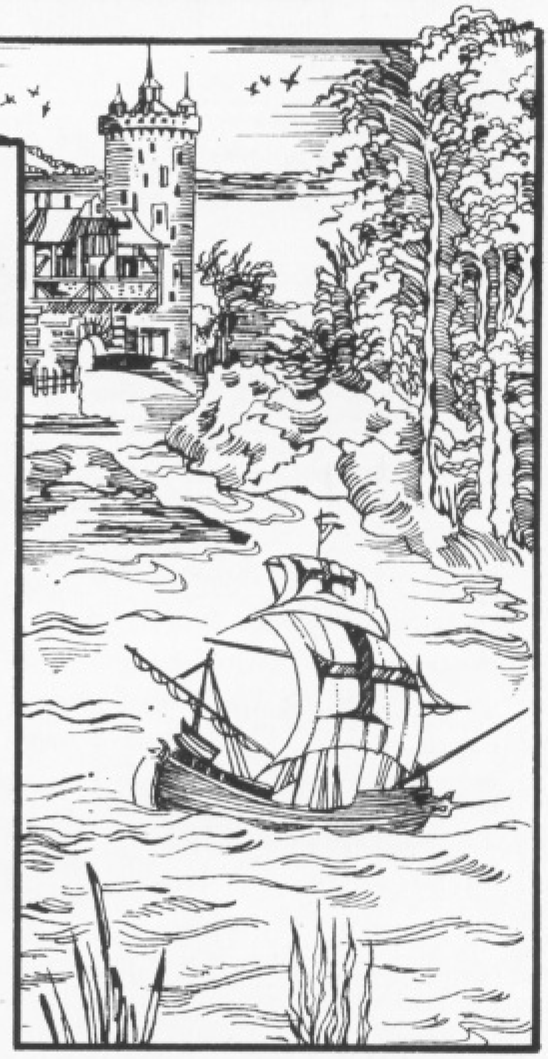
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HINTS AND TIPS

This month's hints and tips concentrate on Infocom's Plundered Hearts. This is not one of the most difficult adventures ever released, but nevertheless it still has its fair share of teasers.

It certainly has its place in adventuring history as one of the few adventures to solely feature a female as the lead character.

● *Can't put out the fire in the hold?*

Tear a piece off your dress, soak it in water and then throw it over the gate.

● *Want to leave the ship?*

Enter the cask and cut the line. Wait for the current to pull you to the island.

● *Lafond giving you a hard time over the wine?*

When he's not looking, squeeze the laudanum into the green goblet. Say "No" when Lafond asks if the green goblet is his.

Drink the wine. When you hear a thump – the butler falling unconscious – get the spice and throw it in Lafond's face.

● *Want to send a signal to the ship?*

Signal from the window using the mirror after throwing the spice at Lafond.

● *Can't find the secret passage?*

Get the hat, take the book from the bookcase, then press Sinistra – or island – on the globe.

THE COMPLETE USER GUIDE

I TOTALLY agree with the letter from Stephen Pratt in the September 1988 issue of Atari User – in particular his reference to several conversations he had with different computer owners. So I have decided to give you my own list of other computer owners and list them in order of tolerence – 1 being the worst and 5 being the least moronic:

1. The BBC owner: Totally intolerable. Has a high death rate in classroom arguments. He thinks the BBC is the best micro in the world despite its poor graphics, miniscule memory and high price. Classic quote: "The BBC really is a good bargain!"

2. The MSX owner: Insufferable. You would think he could understand the lack of software problem, but all he ever talks about is Konami roms. It's a pity rom games play so slowly – especially Nemesis – and they are very expensive. Classic quote: "Konami, Konami, Konami!" in a frenzied state.

3. The Commodore owner: Aaghh!. He thinks his micro is the best in the world because it has all the latest games coming out for it. But why does it take so long to load – even on disc? Fighter Pilot takes two minutes and 27 seconds. Some owners even think Commodore is a British company. Classic quote: "I'm just loading a game, it'll be ready in three weeks time".

4. The Spectrum owner: Barely sufferable. Like the Commodore owner he thinks his micro is the best because of the games for it. But he is at a loss for words when cornered on colour clash, poor sound and the C5. Classic quote: "The sound is very realistic, it reminds me of a fly".

5. The Amstrad owner: Not too bad – at least in my experience, my brother owns one and he's all right. Owners tend to understand the lack of software because of their problems in Amstrad's early days. Classic quote: "Oh dear!"

My letter may seem unfair to some computer owners but it does reflect the conceited opinions of the majority. I would think most Atari owners have, over the years, met people like this – I know I have! – **Christopher Smith, Welling, Kent.**

● Quite a letter Chris, but you missed one computer owner out – the ST owner. Classic quote: "Over rated"

HEAVEN'S ABOVE!

I READ with interest the review of the Atari Planetarium in the August 1988 issue of Atari User. I have had the program for some time now, having bought it because of my interest in astronomy. I have discovered that it not only shows sights in the heavens, but depending on the city, it also shows local landmarks.

For example, in London it is the tower of Big Ben – but not the rest of the building. Other cities I have discovered this interesting feature in are: Toronto (CN Tower), New York (Empire State Building), San Fransisco (Golden Gate Bridge).

Surprisingly though, Sydney's two famous landmarks aren't shown.

There could be others, but I haven't yet found them. I'm too busy viewing astral events past, present and future. I own an 8 bit and ST – I didn't have the heart to get rid of my 8 bit when I got the ST – and it's a shame the new machine can't match the older one in quality software of this nature. – **C. G. Christie, London.**

● It's nice to see you have still kept attached to your roots. But we have found that a lot of ST owners were formally 8 bit enthusiasts who defected.

Hollywood or bust

ON Monday September 12 I sat myself down in front of the television without the slightest intention of switching my computer on. The cult science-fiction movie Bladerunner was on and I wasn't going to miss it.

There I was enjoying the action when I caught sight of a neon Atari logo. At first I thought I was mistaken, but no, it was definitely there. Around this time the ST wasn't on the scene and the major Atari computer was the 8 bit.

This shows just how popular, and how well advertised, the 8 bit is in America. It's a shame Atari UK doesn't take heed of this and look after the best 8 bit like its American counterpart. – **Martin Wilkinson, Catterick, Yorks.**

● This just goes to show what a star of the silver-screen your Atari 8 bit is.

Driven to piracy

I HAVE been an Atari owner for four years now and I use my machine mainly for entertainment. During this period of time I have spent more than £300 on good quality disc software. I am very proud of my all-original collection and I strongly speak against any form of computer software piracy.

Which brings me to the point of my letter. During these four years of owning an Atari, the software supply has always been limited when compared to that available for many other machines. You could say I have, at times, envied some of these micro owners.

This isn't because the Atari can't match the quality of these micros – in fact it totally surpasses them in hardware design.

It's the fault of the software houses. They simply don't bother to convert popular programs to run on the 8 bit Atari.

About a month ago I came across two absolutely fabulous pieces of games software for my Atari and they have had me glued to my television set ever since – Elite and The Last Ninja.

The catch? Well, both games are pirated and, as far as I know, haven't been released in the UK. I would like to know why they haven't been released? I'm not surprised some people are lured from buying originals. It is a shame that quality software of this nature is denied us. What makes it worse is that there are many more games where these two came from.

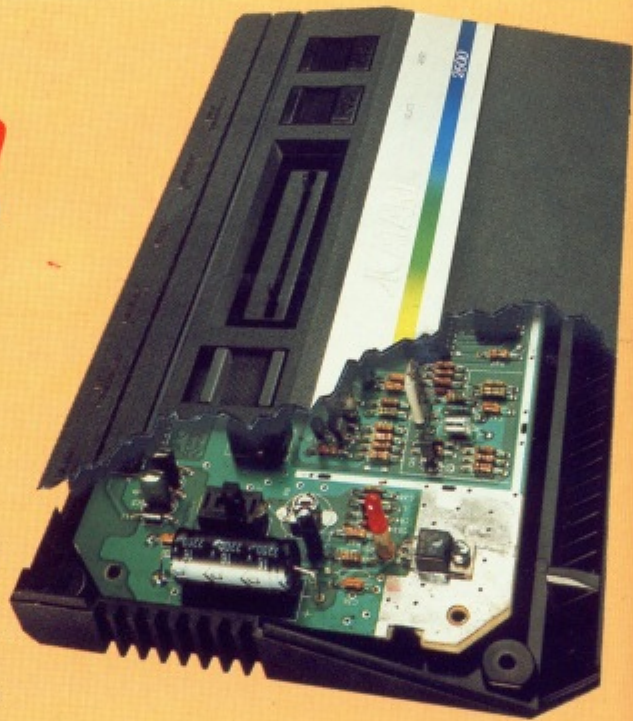
So, can Atari User tell me who is producing such wonderful games and why software houses haven't released them? – **Name and address supplied.**

● Frankly, we don't know who is producing these games. A few years ago there was a rumour that Elite had been written, but Firebird had quashed its release. As to The Last Ninja we have heard nothing.

It is a possibility that independent programmers – those outside a software house – have produced the games at home.

The VCS System

NEIL FAWCETT casts a critical eye over more rom cartridges for the 2600



I AM looking this month at Dragster, Beamrider, Fire Fighter, Laser Blast, Skindiver and Grand Prix. They come from a number of companies – Activision, Imagic and Sancho – and vary in quality.



Dragging along

Product: Dragster
Price: £9.95
Supplier: Activision, 23 Pond Street, Hampstead, London NW3 2PN.
Tel: 01-431 1101

THE Dragster cartridge tells you that you have just bought one of the most exciting video games ever designed. It also tells you that this is a very complicated game and takes a little time to learn.

In the very early days when Dragster first came out I would have agreed with the first comment – but not now. Dragster, as the title informs you, is about driving one of the world's fastest accelerating cars in a race against time.

As the clock counts down your stomach begins to churn with excitement and then it reaches zero and you are off down the track at around 100mph. You control your car with a joystick which operates the clutch, gear stick and, as the Americans call it, the gas.

By combining several joystick movements you can change gears upward quickly and accelerate your car down the course – but remember, you can't go down through the gears.

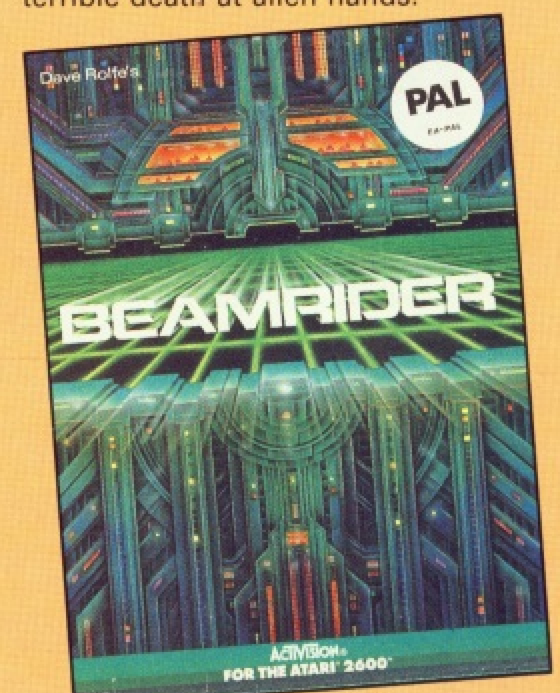
Were this a new game I would criticise it heavily, but in view of it's years I'll pull my punches. The graphics are plain and the sound effects abysmal. Gameplay is average, but I got fed up after I'd been racing only a short time.

Beam me up VCS

Product: Beamrider
Price: £9.95
Supplier: Activision, 23 Pond Street, Hampstead, London NW3 2PN.
Tel: 01-431 1101

SET in the upper reaches of Earth space, a web of blue beams has spread everywhere. They are being used by alien life forms to invade our planet.

Will you just watch, or will you take the required action and fight? If you choose to fight it's time to roll up your sleeves, mount the beams and ride. If you opt to watch you're in for a terrible death at alien hands.



Animated graphics create a 3D perspective that virtually pulls you into the screen. Pulsating sound effects intensify the action as a dizzying array of objects zips from beam to beam.

The game features numerous different aliens to destroy. Each sector you enter is progressively harder and you must be on your guard at all times.

Beamrider involves fast action, is fun to play and tests your reaction time and nerve. If you love a good shoot-'em-up give it a try. It combines tomorrow's technology with game designer Dave Rolfe's fantastic imagination to forge a challenge you'll return to again and again.

Fiery challenge

Product: Fire Fighter (Imagic)
Price: £9.95
Importer: Atari World, 11 Fennel Street, Manchester M4 3DU.
Tel: 061-834 4941

MIDNIGHT. The city sleeps. Suddenly, a cry pierces the night: "Fire! A man's trapped up there!" A raging blaze crackles and climbs. A desperate man waves his arms and races from window to window, floor to floor. His situation looks hopeless.

Be strong. Douse the flames with your hose. Line up your ladder and save him. Keep trying, you're his last chance – his only chance.

As the fire spreads even higher, he climbs a floor at a time to escape the blaze. Only by reaching him with your ladder can he be saved. Put out the flames then race back to the fire engine, jump on and scramble up the ladder. Then snatch him from his fiery peril to the safety of the ground below.

You direct your rescue operations

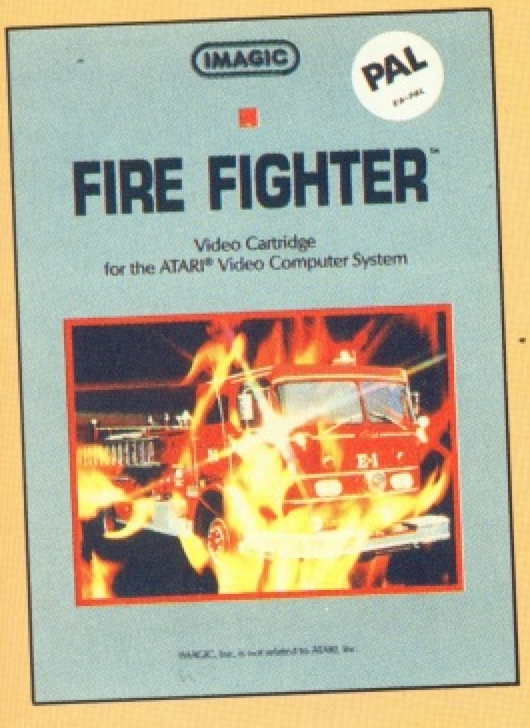
with the left joystick controller and when the game begins, your fire fighter appears on the fire engine. Move him to the front of the warehouse and turn the water on – you have a limited supply, so make it count.

Extend the ladder until it rests directly against the warehouse wall. Have the fire fighter jump back on to the engine by leaning the joystick to the right then move him up the ladder towards the man.

You've won the game when the ladder has been extended to the floor where the man is waiting and he joins you on the ladder.

Following this comes a jubilant rendition of "For he's a jolly good fellow" which signals a job well done.

Fire Fighter is a wonderfully addictive game which will keep you busy for some time. Adequate graphics and average sound effects complement the gameplay making this cartridge a winner.

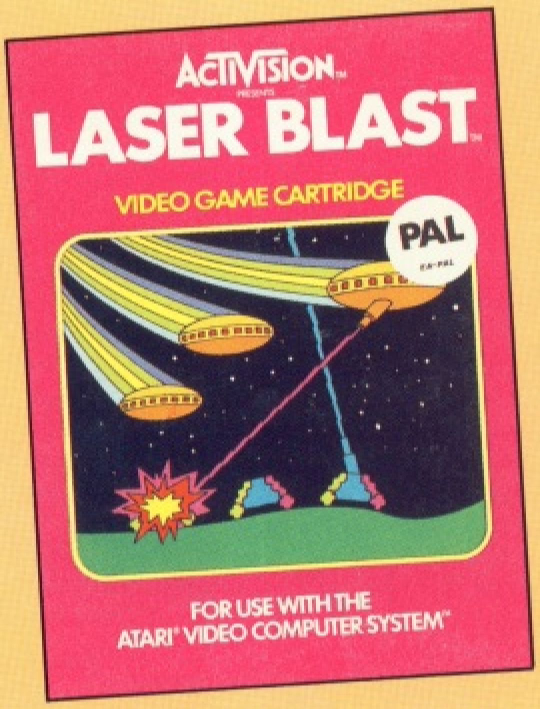


Beat off the aliens

Product: Laser Blast
Price: £9.95
Supplier: Activision, 23 Pond Street, Hampstead, London NW3 2PN.
Tel: 01-431 1101

AS the intrepid commander of a fleet of intergalactic spacecraft, you're engaged in a vicious battle with a race of aliens – and they're no pushovers.

Their radar systems track your every move and their force fields block your



every advance. Even when you destroy a wave of attackers, tougher, more skillful reinforcements replace them.

But keep on fighting: The more attackers you destroy the more points you earn, and eventually it will be your turn for reinforcements in the form of an extra life.

The screen is split into two main sections. At the top is your lead ship and reserve fleet. The remainder is taken up by the lunar surface on which the enemy bases you must destroy are located.

These ground attack forces are equipped with radar detection systems which help them aim their lasers at your ships. If you allow your ship to hover in one place too long, the enemy will quickly line your ship in its sights, leading to disastrous results. By flying low to the ground you can keep your craft under the radar.

However, as the battle progresses each new regiment of enemy attackers has a stronger force field, which gradually forces your ship farther away from the ground, making it an even easier target.

Don't give up when you take a direct hit. Even though your ship will quickly lose altitude you can still control its descent and crash into a base. This accomplishes two things – it destroys the attacker and it adds the value of the destroyed installation to your points total – which gets you even closer to receiving an extra ship.

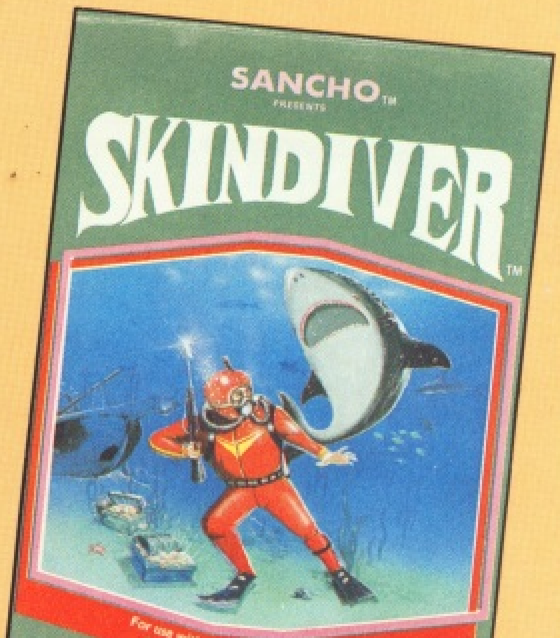
The graphics, sound effects and playability of Laser Blast are average. If you have bought all the other 2600 cartridges and want another one for your collection buy it. But at the end of the day it's just another zap-the-aliens shoot'em up.

Sunken treasure

Product: Skindiver (Sancho)
Price: £9.95
Importer: Atari World, 11 Fennel Street, Manchester M4 3DU.
Tel: 061-834 4941

FABULOUS wealth in the form of gold, diamonds, rubies and emeralds await a brave diver. But beware, man-eating sharks, sea monsters and other dangers lurk below the surface protecting the sunken treasure. Many have tried to steal the booty from its watery grave, but all have failed never to be seen again. Now it's your turn, if you dare.

The game consists of two levels which must be negotiated. The first has you spearing fish with your harpoon gun. When you have killed them all you must enter the sunken galleon at the bottom of the screen – this will take you to level two.



Be very careful though, the walls of the galleon are sticky and if your diver touches them he will be stuck until you free him by rattling the joystick from left to right. If he hits the wall at high speed he will stay there until his oxygen runs out and he dies.

Inside this ship lurk three huge sea monsters which protect the treasure. You can't kill them if you shoot at them so you must dodge them by swimming away. You will notice some

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narrow openings in the sides and walls of the ship which your diver can go through, but the sea-monsters can't.

Watch your oxygen supply at all times. After retrieving a treasure chest or, if your oxygen supply is too low, you will have to return to level one.

The graphics and sound effects are reasonable as is the gameplay, but I recommend you try before you buy. It is one of those games that some people will love and others hate.

Life in the fast lane

Product: Grand Prix
Price: £9.95
Supplier: Activision, 23 Pond Street, Hampstead, London NW3 2PN.
Tel: 01-431 1101

BUCKLE up, snap your chin strap, adjust your goggles and get ready to handle a high-powered formula racing machine. You'll need all the nerve, anticipation and reflexes of a world champion race driver to master the circuit facing you.

Feel how your steering and handling change as you pick up speed. Ease your car past competitors, over oil slicks and across bridges at blinding speed.

You'll hear the sound and fury of a true Grand Prix event. Your engine whines louder and higher as your car reaches maximum revs. Your wheels hum faster on the asphalt and your competitors zoom by. If you hit your brakes, your tyres squeal.

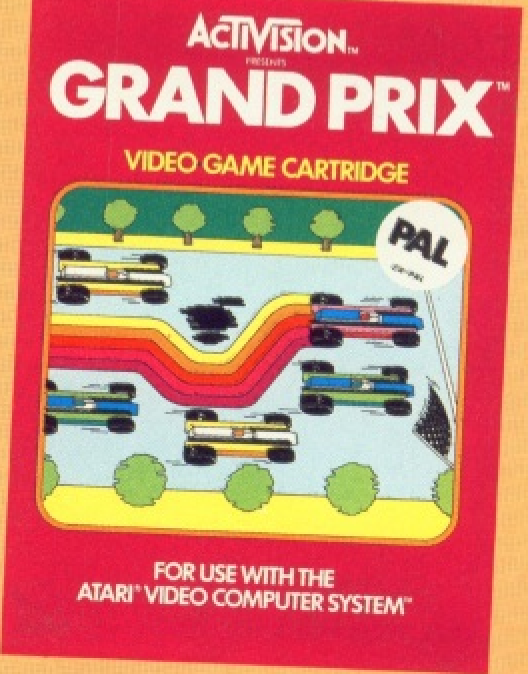
It's you against the clock, the road and the other drivers in a race to the finish line. This all sounds great fun, and it is. The graphics and sound effects aren't brilliant but at least your car looks like a car – unlike some games I could name.

You have the choice of four tracks – Watkins Glen, Brands Hatch, Le Mans and Monaco. The main difference between them is the number of bridges you have to negotiate.

A couple of slow practice runs through the courses will help you get the feel of the track. You'll also find that, just as in real racing, the faster your car is going, the easier it is to lose control. That's why pacing is so important – try to think ahead and anticipate what's coming up next.

When you pass a car you'll almost never have to worry about it catching up with you from the rear. So keep your eyes on the road ahead – that's where the action will be.

Grand Prix is very playable and well priced at £9.95. If you like a challenge and fancy a spin give it a try.



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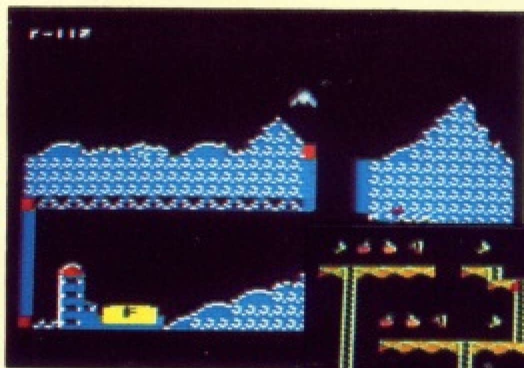
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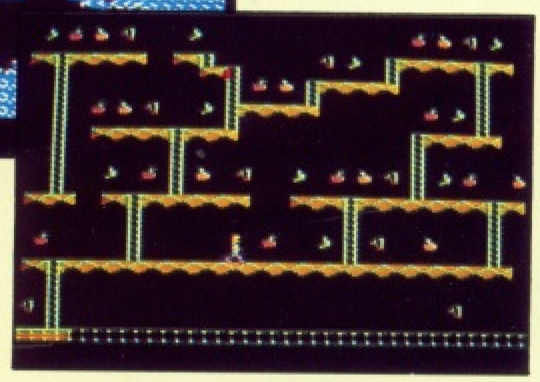
Chopper Rescue – Take command of a helicopter to rescue lost soldiers
Des Bells – Rescue Esmerelda by negotiating the dangerous obstacles
Spacemaze – Fly your spacecraft through the deadly caverns below the lunar surface
Mazemunch – Guide your munch monster around the maze, avoiding its deadly inhabitants
Moneybags – Gobble up all the money but beware of the sinister spiders
Frank the Fruit Fiend – Help Frank eat his favourite food in this platform game
Duck Dash – Dash round and chase up all the ducks before the storm hits the farm
Frogjump – Direct the frog across the busy road in this classic arcade game
Doctor Boris – Help the doctor build the new hospital, but watch out for mad Norman

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Vol. 1 (For details of the new Vol. 2 see page 52)



Frank the Fruit Fiend



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MICRO

STEPHEN FAWCETT takes a look at what the 8 bit Atari has to offer adventurers and wargame players

OVER the years a number of companies have produced several strategy/adventure games on the Atari 8 bit micros. Perhaps the best known of these software houses is SSI – Strategic Simulations Incorporated.

However, it hasn't had a monopoly. Datasoft produced the best fantasy based graphics adventure duo to appear on the scene – Alternate Reality I and II. Origin Systems also entered the market with the fabulous Ultima series and set a high standard of quality.

When Alternate Reality: The City appeared it was a huge leap forward for computer-based adventures and is to this day the most comprehensive computer-fantasy game I have played.

In it you are walking one day when a giant alien spaceship descends and hovers above your city. Soon it begins zapping people and beaming them up to be transported across the universe to an alternative reality – another planet where they are treated as slaves.

This is where the adventure begins, with you being let loose to explore the city in an attempt to escape home – just like E.T. Unfortunately, your journey is hampered by the strange life forms which inhabit the labyrinth of roads and alleyways that make up the huge city complex.

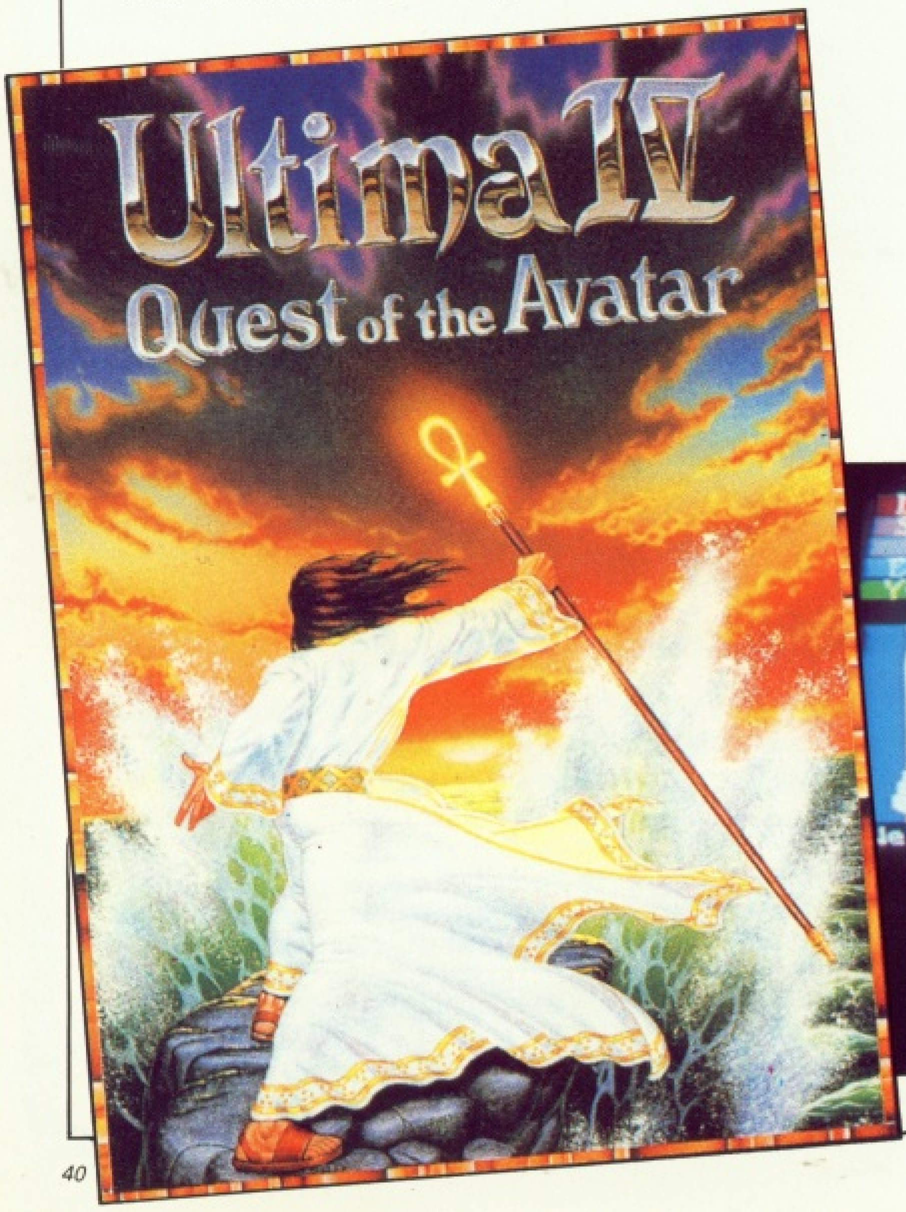
Your encounters can range from being bothered by a beggar to being zapped by a wizard. Luckily a number of options are open to you, and if you think about a situation carefully enough you can often get out of it easily.

The sound and graphics are of an outstandingly high quality. Each building you enter is accompanied by a multi-coloured visual image of a shopkeeper or sage, depending on where you go. Usually the owner of the premises sings a short song to you.

The sequel to this fantasy world, The Dungeon, offered me another multitude of delights. Similar in layout – that is, rooms, passageways and mazes – to the original adventure, you are now classed as an experienced citizen in the city. This is why you are allowed to venture deep into the underground catacombs in an attempt to learn more about this strange world.

Each adventure comes with a comprehensive booklet outlining everything you will need to know to survive. A partial map is included in the package and you should use it as a base for exploring and mapping the rest of the game. Also included is an artist's impression of major Dungeon sites.

As you can see from the screen shot, the graphics are brilliant and





Alternative Reality: The City

BATTLEFIELD

colourful. It's a shame that Datasoft hasn't brought out any more modules to add to this series. I would buy them straight away.

Soldiers at the ready

My next choice comes from the selection of wargames currently available from SSI – Strategic Simulations. Computer Ambush is based on the exploits of a group of American GIs who are engaged in combat with a squad of German troops in a small village somewhere in France.

The first thing you read when you open the game manual is the following quote taken from The Art of War, written by Sun Tzu around 500 BC referring to the tactical deployment of troops in a battle.

> *Thus those unable to understand the dangers inherent in employing troops are equally unable to understand the advantageous ways of doing so.*

This just about describes this tactical wargame in full. Computer Ambush captures the nerve-tingling excitement and fear of war.

I rate this as SSI's best simulation. A superb vocabulary of commands and instructions are available to you and the documentation is first class. If you like a good fight give this one a try, even though it carries a hefty price tag – £19.99 – it's well worth every penny.

Four times an adventure

In the beginning of 1980 a young programmer called Richard Garriot created a fantasy adventure game called Ultima. Based in the mystical world of Sosaria, a band of brave adventurers must explore the magical lands in search of fame and fortune.

Released by Sierra On-Line it went on to sell around 100,000 copies worldwide. This was the start of a fantasy empire which was to set the standards for other companies to follow.

Following this marvellous adventure came Ultima II, Ultima III: Exodus, and Ultima IV: Quest for the Avatar. All four went on to sell well around the world – especially in Japan where computer-based adventuring is very popular.

Methodical game play and superb computer interaction create a vivid world to romp around and an article about adventures just wouldn't be complete without mentioning the Ultima legends.

Futuristic combat

Several years ago Steve Jackson brought out a game called Car Wars. It was a huge success and promptly sparked a large amount of interest in the computing community.

In the latter part of the 1980s Origin Systems released Autoduel which is based on the original board-style Car Wars. Set in the 21st Century somewhere in the NE of America, death lurks round every bend of the freeways.

You build a battle car and cruise around the motorways blasting the scum which inhabit them. As with all the Ultima series, the packaging is excellent. The box contains a miniature toolkit – a very nice touch.

Marvellous game play and a huge range of commands and actions available to you guarantee you will be addicted to this one for a long time.

Which one to buy?

The number of wargame/adventures for you to choose from is vast and you must consider what exactly you want from a game. If it is too complex you will soon lose interest and if too simple you'll tire of it quickly.

A game has to strike a happy balance. Most of the SSI strategic simulations require a lot of reading and knowledge of all the rules. On the other hand, Origin games are usually playable without even reading the manual – though you usually die very quickly.

The Alternate Reality series are very user-friendly and enjoyable. If you are just starting out adventuring or wargaming on a micro be very careful what you buy. An awful lot of people have been put off by a bad choice.

It really can be a fun experience recreating famous battles of old on your 8 bit Atari, so give it a try.

Game	Company
Conflict in Vietnam	MicroProse
Decision in the Desert	MicroProse
Nato Commander	MicroProse
Crusade in Europe	MicroProse
Ultima	Origin
Ultima II	Origin
Ultima III	Origin
Ultima IV	Origin
Ogre	Origin
Autoduel	Origin
Alternate Reality: The City	US Gold/Datasoft
Alternate Reality: The Dungeon	US Gold/Datasoft
Mech Brigade	SSI
Broadsides	SSI
Computer Ambush	SSI
Wargames Construction Set	SSI
Fields of Fire	SSI
The Eternal Dagger	SSI
The Cosmic Balance	SSI
War in Russia	SSI
Colonial Conquest	SSI
Kampfgruppe	SSI
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Questron	SSI
Gemstone Warrior	SSI

These are some of the adventures and wargames currently available for the 8 bit Atari

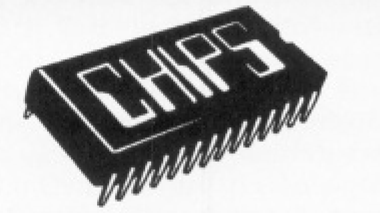
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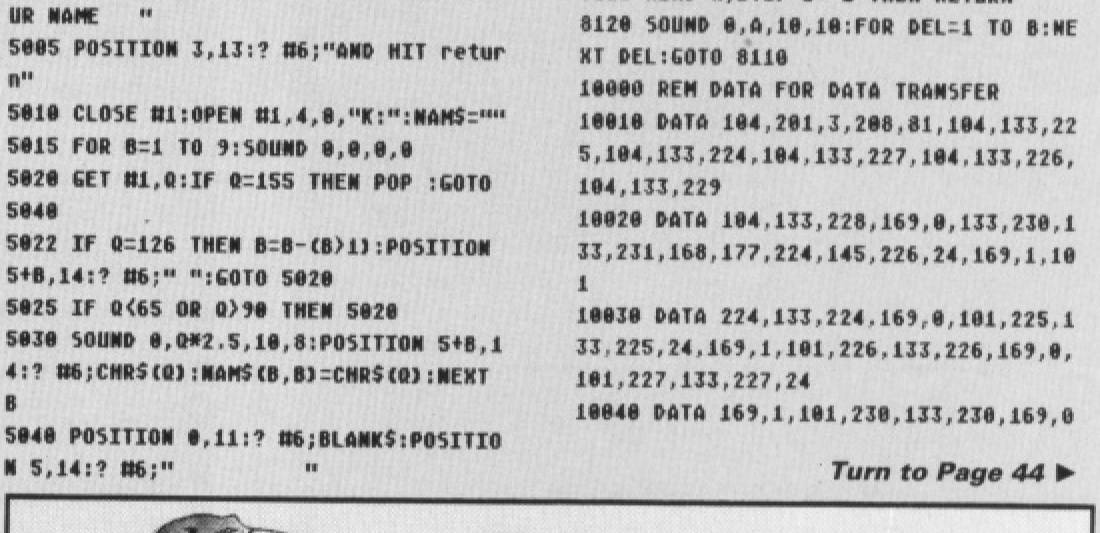
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```
3040 POSITION 2,5:? #6;"├ ┤":POSITION 2,7:? #6;"┤┘":POSITION 2,9:? #6;"├┤":POSITION 2,11:? #6;"├ ┤"
3050 POSITION 2,13:? #6;"┤┘"
3060 POSITION 2,15:? #6;"├┘":FOR A=6 TO 16 STEP 2:POSITION 2,A:? #6;"╱╲◢":NEXT A
3070 A=USR(1536,CHSTORE,ST+560,24)
3080 FOR D=6 TO 16 STEP 2:POSITION 5,D:? #6;TRACK$:POSITION 5,D:? #6;"▯":POSITION 5,D-1:? #6;"▯":NEXT D
3083 FOR A=1 TO 3:POSITION 0,A:? #6;CHR$(A+224):NEXT A:FOR A=5 TO 15 STEP 2:POSITION 0,A:? #6;"▯":NEXT A
3090 POSITION 2,4:? #6;FENCE$:POSITION 2,18:? #6;FENCE$:POSITION 2,0:? #6;WALL1$:POSITION 2,1:? #6;WALL2$
3092 POSITION 15,20:? #6;"abch ▯ ";CHR$(227+LAP)
3095 A=USR(1536,CHSTORE+48,ST+584,32)
3097 IF LAP=1 THEN FOR A=5 TO 15 STEP 2:POSITION 39,A:? #6;"▯":POSITION 39,A+1:? #6;"▯":NEXT A
3100 POKE 559,34:FOR DEL=1 TO 300:NEXT DEL
3110 FOR D=6 TO 16 STEP 2:POSITION 5,D:? #6;"▖":POSITION 5,D-1:? #6;" ":NEXT D
3119 REM MAIN LOOP
3120 FOR Q=0 TO 3:A=USR(1536,CHSTORE+24+Q*56,ST+560,56)
3130 GOSUB 4000
3140 NEXT Q
3150 GOTO 3120
3999 REM MOVE DOGS
4000 X=INT(RND(0)*6)+1
4010 HORIZ(X)=HORIZ(X)+INC(X)
4020 POSITION HORIZ(X)-1,X*2+3:? #6;"├";CHR$(2+2*(X=2 OR X=5)+131*(X=6)+130*(X=3));"┘"
4030 POSITION HORIZ(X)-1,X*2+4:? #6;"▖╱╲◢":IF HORIZ(X)<36 THEN RETURN
4040 GOSUB 4500:POSITION 36,X*2+3:? #6;"   ":POSITION 36,X*2+4:? #6;"▖▖▖":HORIZ(X)=2:GOTO 4020
4050 RETURN
4499 REM NEXT LAP
4500 POKE 77,0:L(X)=L(X)+1
4510 IF L(X)=LAP+1 THEN 4700:REM RACE OVER?
4520 INC(X)=INC(X)-0.2*(FM(X)=1)+0.12*(FM(X)=2)+0.2*(FM(X)=3 AND L(X)=2)-0.1*(FM(X)=3 AND L(X)=3)
4525 INC(X)=INC(X)-0.48*(FM(X)=3 AND L(X)=4)+0.35*(FM(X)=6 AND L(X)=3)
4530 POSITION 0,X*2+3:? #6;CHR$(L(X)+227):REM PRINT LAP NUMBER
4539 REM PRINT FINISHING POST IF LAST LAP
4540 POSITION 39,X*2+3:? #6;CHR$(32+205*(L(X)=LAP)):POSITION 39,X*2+4:? #6;CHR$(9+229*(L(X)=LAP))
4550 RETURN
4699 REM WINNERS SCREEN
4700 FOR DEL=1 TO 100:NEXT DEL:GRAPHICS 0:POKE 752,1:POKE 710,50:POSITION 16,0:? "WINNERS":?
4705 ? "DOG ";CHR$(176+X);" HAS WON AT ";ODDS(X);" TO 1"
4709 REM IS THERE A WINNER?
4710 FOR A=1 TO N
4715 IF DOG(A)=X AND BET(A) THEN W=1:FOR B=0 TO 9:C=ASC(NAME$((A*10)-9+B)):IF C=32 THEN GOSUB 4800:POP :GOTO 4730
4720 IF DOG(A)=X AND BET(A) THEN ? CHR$(C+128);:NEXT B
4730 NEXT A
4735 IF W=0 THEN ? :? :? "NOBODY WINS":GOSUB 8000:REM NO WINNERS
4740 FOR A=1 TO N:BET(A)=0:NEXT A:FOR A=1 TO 6:HORIZ(A)=2:L(A)=1:NEXT A:REM RESET COUNTERS
4745 FOR A=1 TO N:IF CASH(A)=0 THEN GOSUB 7000:REM ANYONE WITH NO CASH?
4746 NEXT A:W=0
4750 FOR DEL=1 TO 50:NEXT DEL:GOTO 4900
4799 REM WINNINGS SUBROUTINE
4800 ? :? "Stake ";BET(A);" Odds ";ODDS(X);" to 1   Winnings ";BET(A)*ODDS(X)
4810 CASH(A)=CASH(A)+BET(A)+BET(A)*ODDS(X)
4820 RESTORE 30400
4830 READ C,B:IF B=-1 THEN RETURN
4840 SOUND 0,C,10,10:FOR DEL=1 TO B:NEXT DEL:GOTO 4830
4899 REM END OF THIS RACE
4900 POSITION 13,21:? "GONE TO THE DOGS":POSITION 5,22:? "PRESS        FOR THE NEXT RACE"
4910 POSITION 11,22:? "START"
4920 RESTORE 29000
4930 READ A,B:IF B=-2 THEN POSITION 11,22:? "     ":GOTO 4930
4935 IF B=-3 THEN POSITION 11,22:? "START"
4940 ON B=-1 GOTO 4920:SOUND 0,A,10,10:FOR DEL=1 TO B/2:IF PEEK(53279)=6 THEN POP :GOTO 300
4950 NEXT DEL:GOTO 4930
4999 REM ENTER NAMES SUBROUTINE
5000 POSITION 2,11:? #6;"PLAYER ";A;" PLEASE":POSITION 0,12:? #6;"  enter YOUR NAME   "
5005 POSITION 3,13:? #6;"AND HIT return"
5010 CLOSE #1:OPEN #1,4,0,"K:":NAM$=""
5015 FOR B=1 TO 9:SOUND 0,0,0,0
5020 GET #1,Q:IF Q=155 THEN POP :GOTO 5040
5022 IF Q=126 THEN B=B-(B>1):POSITION 5+B,14:? #6;" ":GOTO 5020
5025 IF Q<65 OR Q>90 THEN 5020
5030 SOUND 0,Q*2.5,10,8:POSITION 5+B,14:? #6;CHR$(Q):NAM$(B,B)=CHR$(Q):NEXT B
5040 POSITION 0,11:? #6;BLANK$:POSITION 5,14:? #6;"          "
5042 POSITION 0,12:? #6;BLANK$:SOUND 0,0,0,0
5043 POSITION (19-(LEN(NAM$)+5))/2,12:? #6;"O.K. ";NAM$
5045 POSITION 3,13:? #6;"  GOOD LUCK  ":FOR DEL=1 TO 150:NEXT DEL:NAME$((A-1)*10+1,A*10)=NAM$
5047 POSITION 5,13:? #6;"            "
5050 RETURN
6999 REM PLAYER HAS NO KITTY
7000 IF DR(A)=1 THEN 7010
7005 ? NAME$((A*10)-9,A*10);" HAS NO CASH LEFT AND MUST ":? " DROP OUT":DR(A)=1:GOSUB 8100
7010 IF DROP=N THEN POP :GOTO 7500:REM ARE ALL PLAYERS BROKE?
7020 RETURN
7499 REM END OF GAME:ALL PLAYERS BROKE
7500 FOR DEL=1 TO 300:NEXT DEL:GRAPHICS 18:POSITION 4,9:? #6;"PRESS start"
7505 POSITION 1,7:? #6;"all punters broke├":POSITION 2,3:? #6;"gone to the dogs"
7510 POSITION 2,11:? #6;"FOR A NEW GAME"
7515 FOR A=1 TO 9:BET(A)=0:DOG(A)=0:NEXT A:FOR A=1 TO N:CASH(A)=100:DR(A)=0:NEXT A:DROP=0
7520 RESTORE 30500
7530 READ A,B:IF B=-1 THEN 7520
7533 IF B=-2 THEN POSITION 10,9:? #6;"start"
7537 IF B=-3 THEN POSITION 10,9:? #6;"START"
7540 SOUND 0,A,10,10:FOR DEL=1 TO B:IF PEEK(53279)=6 THEN POP :SOUND 0,0,0,0:GOTO 200
7550 NEXT DEL:GOTO 7530
8000 RESTORE 30200
8010 READ A,C,B:IF B=-1 THEN RETURN
8020 SOUND 0,A,10,10:SOUND 1,C,10,10:FOR DEL=1 TO B:NEXT DEL:GOTO 8010
8100 DROP=DROP+1:RESTORE 30300
8110 READ A,B:IF B=-1 THEN RETURN
8120 SOUND 0,A,10,10:FOR DEL=1 TO B:NEXT DEL:GOTO 8110
10000 REM DATA FOR DATA TRANSFER
10010 DATA 104,201,3,208,81,104,133,225,104,133,224,104,133,227,104,133,226,104,133,229
10020 DATA 104,133,228,169,0,133,230,133,231,168,177,224,145,226,24,169,1,101
10030 DATA 224,133,224,169,0,101,225,133,225,24,169,1,101,226,133,226,169,0,101,227,133,227,24
10040 DATA 169,1,101,230,133,230,169,0
```

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Game

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```
,101,231,133,231,24,165,228,197,230,20
8
10050 DATA 206,165,229,197,231,208,200
,96
10100 REM DATA FOR DLI COLOUR CHANGE
10110 DATA 72,169.0,141,23,208,169,14,
141,25.208,169,42,141,10,212,141,24.20
8,104,64
20000 REM DATA FOR BODIES
20005 DATA 0,0,0,0,0,65.21.5,0.0.0.0,0
,106,106,106,0,0,20,21,20,80,80,80
20010 DATA 0,0,0,0,0,127,127,127,0.0.0
,0,0,127,106,127
20015 REM DATA FOR LEGS,TRACK,FENCE AN
D CROWD
20020 DATA 5,5.4,4.1,1,0,84,0.0,0,0,0,
0.0,84,16,16,16,16,16,16.0,84
20025 DATA 5.5,4,4.16,16,0,84,0,0,0.0.
0,0,0,84,16,4,4,1,0,0.0,84,0,0,0,0,0,0
,0,84,255,3,3,1,1,255,3,3,0,0,0,0
20026 DATA 0,154,154,85,169,169,85.154
,154,85,169,169
20030 DATA 5.5,20,80,0,0.0.81.0.0,0,0,
0,0,0,81,16,16,64,64,64.64,0,81,0,0,0,
0,0.0,0,81,255,48,48,16,16,255,48,48
20031 DATA 0,0,0,0,0,106,106,85,166,16
6.85,106,106,85,166,166
20035 DATA 5,5,1,0,0,0,0,69,0,0.0,69.1
6.0,0,69,16.64,64,0,0,0,0,69,0,0.0,0.0
,0,0,69,255,3,3,1,1,255,3,3
20036 DATA 0,0,0,0,0,169,169,85,154,15
4,85,169,169,85,154,154
20040 DATA 5,5,4,4,1,1,0,21,0,0,0,0,0,
0,0,21,16,4,4,16,0,0,0.21,0,0,0,0,0,0,
0,21,255,48,48,16,16,255,48,48
20041 DATA 0,0,0,0,0,166,166,85,106,10
6,85,166,166,85,106,106
20110 REM DATA FOR NUMBERS & LETTERS
20111 DATA 0,48,48,48,48,48,63,0,0,12.
51,51,63,51,51,0,0,60,51,51,60,48,48.0
20112 DATA 0,12,60,12,12,12.63,0,0,12,
51,3,12,48,63.0,0,63,3,12,3,51,12,0,0,
3,15,51,63,3,3,0
20113 DATA 0,12,51,48,12.3,60,0,0,0,0,
63,0,63,0,0
20114 REM FINISHING POST
20115 DATA 0,0,16,68,68,68,16,48,48,48
,48,48,48,48,48,0
20120 REM DATA FOR TRAP & JACKETS
20130 DATA 1,RED,2,BLUE,3,WHITE,4,BLAC
K,5,ORANGE,6,WHITE/BLACK
20199 REM DATA FOR FORM
20200 DATA QUICK STARTER.FADES OVER DI
STANCE
20201 DATA SLOW STARTER.GOOD STAYER
20202 DATA GOOD MIDDLE DISTANCE RUNNER
20203 DATA UNKNOWN.FIRST RACE
20204 DATA LITTLE FORM.PUTS IN ODD GOO
D SPRINT
20205 DATA GOOD SPRINTER IN LAST 1/2 O
F LONG RACE
20206 DATA WAS GOOD ONCE.JUST RECOVERE
D INJURY
20207 DATA CAN BE GOOD BUT INJURY PRON
E
20208 DATA FIRST RACE.BRED FROM GOOD S
TOCK
20209 DATA POOR SO FAR.IMPROVING EACH
OUTING
28999 REM Tune #1
29000 DATA 96,15,0,1,81,15,0,1,81,15,0
,1,96,15,0,1,81,15,0,1,72,15,0,1,81,15
,0,1,96,40,0,1,0,-2
29010 DATA 96,15,0,1,108,60,0,1,96,15,
0,1,108,40,0,1,0,-3
29020 DATA 96,15,0,1,81,15,0,1,81,15,0
,1,96,15,0,1,81,15,0,1,72,15,0,1,81,15
,0,1,96,40,0,1,0,-2
29030 DATA 96,15,0,1,108,15,0,1,96,15,
0,1,108,15,0,1,121,60,0,-2,0,100,0,-3,
0,-1
29999 REM Tune #2
30000 DATA 81,4,0,1,81,4,0,1,81,10,0,1
,81,4,0,1,81,4,0,1,81,10,0,1,81,10,0,1
,60,10,0,1,53,10,0,1,47,10,0,1
30010 DATA 81,4,0,1,81,4,0,1,81,10,0,1
,81,4,0,1,81,4,0,1,60,10,0,1,47,10,0,1
,53,10,0,1,64,10,0,1,81,10,0,1
30020 DATA 81,4,0,1,81,4,0,1,81,10,0,1
,81,4,0,1,81,4,0,1,81,10,0,1,81,10,0,1
,60,10,0,1,53,10,0,1,47,10,0,1
30030 DATA 60,4,0,1,47,4,0,1,40,40,0,1
,45,4,0,1,47,4,0,1,53,4,0,1,60,10,0,1,
47,10,0,1,60,10,0,100,0,-1
30099 REM Tune #3
30100 DATA 81,96,60,0,0,1,81,96,10,0,0
,1,81,96,10,0,0,1,68,108,40,0,0,1,81,1
36,40,0,0,1
30110 DATA 68,108,40,0,0,1,60,96,100,0
,0,1,0,0,-1
30199 REM Nobody Wins Tune
30200 DATA 96,47,10,0,0,1,96,47,10,0,0
,1,96,47,10,0,0,1,121,60,80,0,0,10
30210 DATA 108,53,10,0,0,1,108,53,10,0
,0,1,108,53,10,0,0,1,128,64,80,0,0,10,
0,0,-1
30299 REM Drop Out Tune
30300 DATA 144,20,0,1,144,13,0,1,144,5
,0,1,144,20,0,1,121,13,0,1,128,5,0,1,1
28,13,0,1,144,5,0,1,144,13,0,1
30310 DATA 153,5,0,1,144,30,0,10,0,-1
30399 REM Win Tune
30400 DATA 60,15,0,1,81,4,0,1,85,4,0,1
,81,4,0,1,72,15,0,1,81,40,0,1,64,15,0,
1,60,15,0,1,0,-1
30499 REM End Of Game Tune
30500 DATA 81,10,60,10,81,10,96.10,121
,15,72,5,81,5,96,5,81,10,108,35,0,-3
30510 DATA 81,10,64,10,72,10,81,10,91,
10,64,10,72,10,81,55,0,5,0,-2
30520 DATA 81,10,60,10,81,10,96,10,121
,15,72,5,81,5.96,5,81,10,108,35;0,-3
30530 DATA 81,10,64,10,72,10,81,10,91,
10,96,10,108,10,121,55,0,5,0,-2,0,-1
```

Get it right!

1 CAJ (W)	340 2FF (U)	740 GSE (Q)	4499 E9R (F)	5043 OPM (4)	20110 D34 (M)
2 CAK (3)	345 DTR (L)	750 A5D (F)	4500 GOH (O)	5045 JKF (L)	20111 TW4 (5)
3 CAL (V)	350 R9D (M)	760 2Q1 (R)	4510 MHQ (E)	5047 U75 (F)	20112 H5J (4)
10 7K3 (X)	359 E1U (R)	770 VE3 (F)	4520 3UV (X)	5050 VMP (F)	20113 8P3 (M)
20 KS8 (D)	360 8CV (F)	800 WKQ (2)	4525 1W7 (V)	6999 EWT (8)	20114 D54 (N)
30 1VO (9)	364 DUU (O)	810 WF4 (Q)	4530 PO9 (K)	7000 E8N (E)	20115 QSP (4)
40 YK2 (Y)	365 PLM (O)	820 EJT (X)	4539 E1R (K)	7005 7AH (N)	20120 D44 (5)
50 JW1 (J)	366 JRV (D)	830 NW2 (J)	4540 F7T (8)	7010 H1L (4)	20130 KFL (7)
60 MCD (9)	367 NN3 (A)	840 3KL (5)	4550 W8N (C)	7020 VFR (7)	20199 DGM (Q)
70 FU6 (3)	369 E5U (7)	850 ENV (9)	4699 EJR (8)	7499 E9U (6)	20200 18J (2)
75 85V (V)	370 82G (5)	859 E2O (F)	4700 RMT (F)	7500 DW6 (J)	20201 GO5 (H)
80 DU3 (5)	380 XGX (S)	860 EPH (A)	4705 Y5F (Q)	7505 K21 (K)	20202 LSM (F)
90 RAV (9)	385 LQ1 (2)	870 UA3 (2)	4709 E3R (P)	7510 GQM (U)	20203 WWJ (N)
130 D7S (6)	390 4L5 (F)	880 FRR (3)	4710 V3F (O)	7515 1TM (H)	20204 W7Q (T)
140 UVP (U)	400 79Y (V)	890 3MR (E)	4715 R9S (H)	7520 5C7 (2)	20205 XH2 (C)
150 WDR (3)	499 EJV (J)	900 EP7 (V)	4720 8DJ (L)	7530 P7P (9)	20206 6CY (W)
160 XEA (V)	500 27H (U)	910 WM8 (A)	4730 N9V (Q)	7533 QM6 (9)	20207 68G (8)
170 T2C (W)	505 KFK (1)	920 2YU (Q)	4735 SJO (K)	7537 AF6 (K)	20208 R7S (H)
180 F4N (D)	510 SYE (O)	930 T4E (3)	4740 MRK (6)	7540 NT4 (N)	20209 O8A (U)
190 WF1 (O)	519 DJW (8)	2999 EWP (1)	4745 L99 (R)	7550 8P5 (T)	28999 EYM (E)
199 EJS (8)	520 XL3 (S)	3000 SJS (T)	4746 SDM (6)	8000 4L2 (C)	29000 M6O (W)
200 AJV (7)	530 J8D (H)	3020 Q8M (5)	4750 4J9 (7)	8010 7G8 (N)	29010 PMW (4)
210 Q4V (6)	535 HV7 (F)	3030 R2K (Y)	4799 ENR (4)	8020 R2X (K)	29020 M8O (M)
220 QUD (M)	540 GMV (6)	3040 C3H (9)	4800 EYJ (2)	8100 VJH (7)	29030 T7K (A)
230 TAF (F)	545 RQG (N)	3050 EXQ (A)	4810 4WS (5)	8110 UCE (P)	29999 F3M (V)
235 4LX (E)	550 SAE (P)	3060 5H4 (F)	4820 5Q2 (H)	8120 XHR (U)	30000 299 (H)
240 5YP (R)	560 WSU (O)	3070 4YF (N)	4830 VG9 (9)	10000 DO3 (S)	30010 23H (8)
245 3S6 (D)	570 PP7 (C)	3080 SH9 (J)	4840 YJ4 (Y)	10010 89M (W)	30020 2C9 (4)
250 QH2 (1)	599 EJW (7)	3083 VDN (Y)	4899 ESR (U)	10020 UD5 (G)	30030 THG (8)
260 4LH (J)	600 SLG (5)	3090 FEH (5)	4900 O2O (7)	10030 LVH (Y)	30099 DEN (S)
270 6UX (O)	609 DEX (F)	3092 59S (S)	4910 TA3 (X)	10040 S7F (4)	30100 55J (Q)
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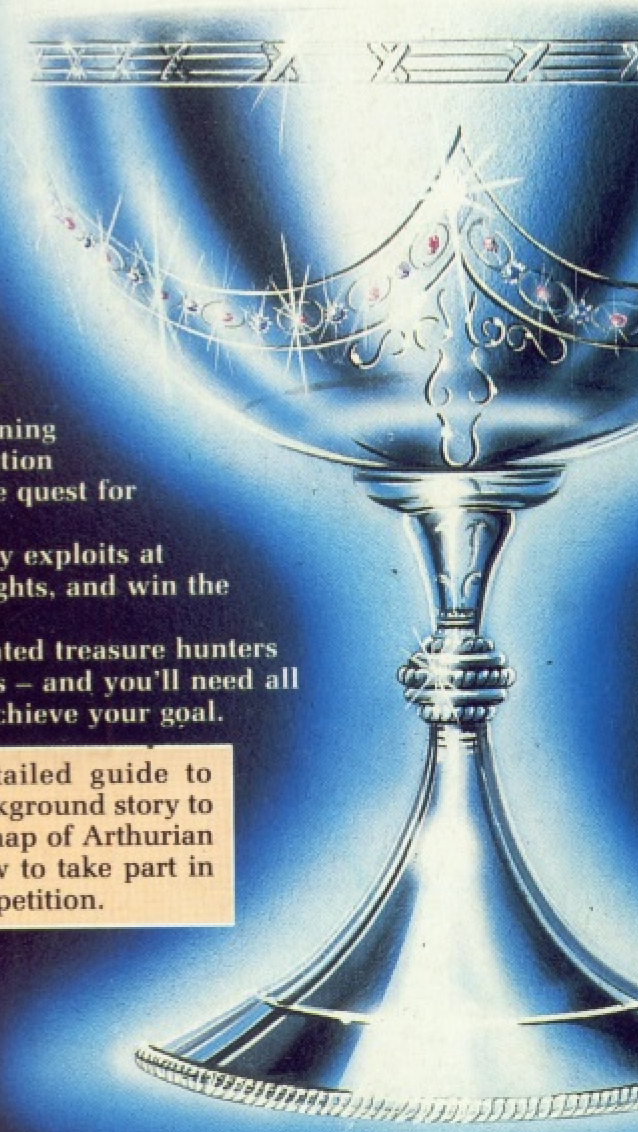
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